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Organizational effectiveness in research and development organizations : an application of Cameron's methodology.

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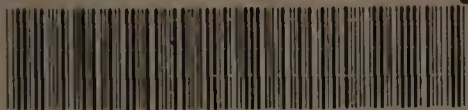
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ORGANIZATIONAL EFFECTIVENESS IN
RESEARCH AND DEVELOPMENT ORGANIZATIONS:
AN APPLICATION OF CAMERON'S METHODOLOGY

A Dissertation Presented

By

Martin Roy Moser

Submitted to the Graduate School of the
University of Massachusetts in partial fulfillment
of the requirements for the degree of

DOCTOR OF PHILOSOPHY

May 1983

School of Management

Martin R. Moser

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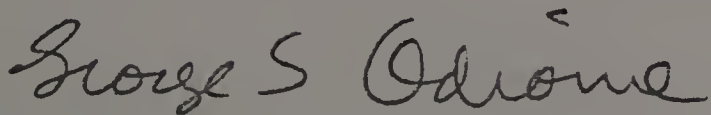
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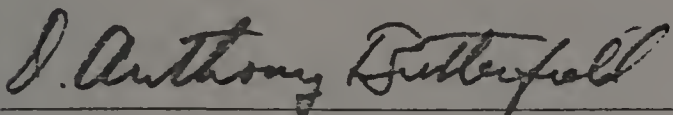
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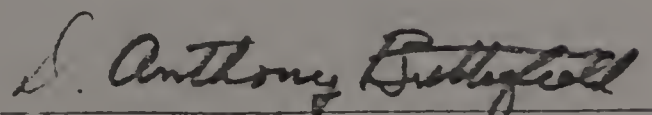
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DEDICATION

This dissertation is dedicated to my parents,
Cynthia and Junius Moser.

ACKNOWLEDGEMENTS

A dissertation is more than a piece of research; it represents the culmination of a much larger process involving many people.

Professor George S. Odiorne, the chairman of my dissertation committee, has been a constant source of inspiration and encouragement. I am very pleased to have had the opportunity to work with him.

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The most important source of understanding and encouragement has been my wife Lynda. I consider myself fortunate to be able to share my dreams and pursuits with her.

ABSTRACT

Organizational Effectiveness in Research and Development
Organizations: An Application of Cameron's Methodology

May 1983

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This dissertation studies organizational effectiveness in research and development facilities. The basic research question of this dissertation is whether it is possible to measure organizational effectiveness in R & D units. Its main intent was to develop a descriptive model of organizational effectiveness for R & D settings.

The proposed outcomes of the dissertation were achieved: (1) discovery of the major factors of organizational effectiveness in R & D settings; (2) development of instrumentation for defining and measuring organizational effectiveness in these settings; and (3) development of descriptive models that may be useful to managers in R & D settings in evaluating the effectiveness of their organizations.

The research consisted of six steps replicating in another environment the methodology utilized by Cameron (1978b) to study organizational effectiveness in institutions of higher education.

A mail survey of 400 R & D managers was conducted. One hundred twenty-four questionnaires were returned and compiled, representing a 31% return rate. The results show that the most popular measures of performance in R & D settings are the quality of output, the degree of goal attainment and the amount of work done on time.

Eleven groupings of variables or dimensions were found to constitute organizational effectiveness in R & D facilities. They were: Organizational Synergy, Unit Health, Information Flows Within the Unit, Employee Career Development, Unit Adaptability, Employee Professional Development, Unit Creativity, Cooperation Within the Unit, Employee Motivation, Degree of Unit's Work Efficiency, and Achievement Recognition Within the Unit.

Statistical procedures largely confirmed the internal reliability as well as the discriminant validity of these dimensions. Further, an indication of construct validity of the eleven dimensions was achieved.

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C H A P T E R I

INTRODUCTION

During the past twenty years R & D management has received its fair share of attention within the social science disciplines. Yet, despite all the academic activity there is little in the research literature that addresses the key issue of organizational effectiveness in an R & D setting.

Currently there are no commonly accepted measures of effectiveness that can be satisfactorily applied to research and development units. The nature of the work in R & D facilities is declared to be highly intangible and the indicators of the results accomplished, e.g., papers, patents, reports, designs, etc., provide no clues as to whether these results were obtained efficiently, or even if they are in fact accurate indicators of effectiveness. For individual managers, common practice is to rely on a combination of intuition and experience as the basis for the development of effectiveness criteria.

Although organizational effectiveness is generally considered a desirable attribute in R & D settings, few attempts have been made to explain the construct either

theoretically or empirically. The construct of organizational effectiveness is seen repeatedly in the literature of R & D management, but there is only a rudimentary understanding of what is actually involve in implementing it. The major research question of this dissertation is whether it is possible to measure organizational effectiveness in R & D units. In order to answer the proposed research question the design must enable the investigator to identify, clarify and measure the construct of organizational effectiveness in R & D settings.

With few exceptions, attempts to measure effectiveness in R & D organizations have focused on the individual performer: the scientist, engineer, or researcher. Little work has been done on the development of alternative organizational effectiveness criteria.

For the purposes of this study, a research and development facility is defined as one in which basic and applied research in the sciences and engineering, and the design and development of prototypes are conducted (Carvalho, 1968). This definition of R & D is compatible with that used by the National Science Foundation. Although the definition is broad, routine product testing, market research, sales promotion and service, research in the behavioral sciences, and other nontechnological activities are excluded. It was not required that the

total firm be involved in R & D but only that an identifiable segment of the organization be an R & D unit.

Previous Research of Effectiveness in R & D Facilities

Historically, the development of effectiveness measures for R & D has been more of a pragmatic search for empirical indices than a formulation of new methodology or theory. The primary thrust of the research has been to attempt to identify objective criteria, or indices of performance, which could be applied across all R & D settings. The focus has been almost solely on the individual performer, utilizing instrumentation borrowed from other studies as the means of data collection. In other studies, objective criteria alone have been used as indices of successful performance. Both methodologies have generated a fair amount of criticism.

The primary method of data collection has been by self-evaluation or evaluation by a knowledgeable-other using structured instrumentation or non-structured interviews.

Studies focusing on individual performance in R & D settings have used evaluation by supervisors (Kaufman, 1978; Steers, 1977; Arvey and Warren, 1976; Arvey and Warren, 1974, Edwards, 1968), peer evaluation (Kasperson, 1973), self-evaluation (Dailey, 1979; South, 1977; Hall

and Mansfield, 1975; Barnett, 1966), or evaluation by a combination of observers (Dailey, 1979; Gross, 1978; Gross and Kissler, 1978; Dailey and Morgan, 1977; Latham and Mitchel, 1976; Pelz and Andrews, 1976; Roblee, 1976; Barnowe, 1975; Arvey and Warren, 1974; Kaufman, 1974; James and Ellison, 1973; Williams and Seiler, 1973; Avarn, Morgan and Esbeck, 1971; Strauss, 1966a; Strauss, 1966b).

Structured instruments have been used for data gathering (Dailey, 1979; Dailey and Morgan, 1979; South, 1977; Latham and Mitchel, 1976; Arvey and Warren, 1976; Hall and Mansfield, 1975; Kaufman, 1974; Arvey and Warren, 1974; Williams and Seiler, 1973; Barnett, 1966), as well as non-structured or open ended techniques (Gross, 1976; Kasperson, 1978; Kaufman, 1978; Steers, 1977; Barnowe, 1975; Williams and Seiler, 1973). Combinations of structured and non-structured methods have been developed and utilized (Gross, 1977; Gross and Kissler, 1978; Kaufman, 1978; Stumpf, 1977; Pelz and Andrews, 1976; Kaufman, 1974; Williams and Seiler, 1973; Avam, Morgan and Esbeck, 1971).

These methodologies have been sufficiently challenged. It has been demonstrated that most people have unrealistically favorable perceptions of their own performance (Meyer, 1980) and that a person's perception of his own productivity may vary considerably from more objective measures (Strauss, 1966c). It has also been

demonstrated that performance scores can be distorted in either higher or lower directions by manipulating a researcher's behavior (Smith, 1980).

Objective measures such as numbers of patents, publications, reports, presentations, project approvals, project completions, and salary and age level have been used in previous research as criteria for effectiveness (Gross, 1978; Gross and Kissler, 1978; Kasperson, 1978; Stumpf, 1977; Van Duren 1976; Pelz and Andrews, 1976; Barnowe, 1975; Kaufman, 1974; James and Ellison, 1973). A major question in the use of these objective measurements as indices of effectiveness is whether they are truly representative of the context of the work setting (Steers, 1975; Whitley and Frost, 1971).

Research on organizational effectiveness in R & D settings is especially problematic because the major approaches described in the literature focus on individual performance. The construct of organizational effectiveness has mostly been ignored.

In order to measure work group or laboratory performance, some studies have simply used aggregates of individual output to reflect group influence and by-passed the problem of how group characteristics influence individual productivity (Whitley and Frost, 1971). Some criteria for group measures that have been used are: frequency of cost

and schedule overruns, "management by objectives" criteria, and the percentage results adopted by the organization. The shortcoming of these approaches is that the criteria are either self-determined, and thus not scientifically very interesting; or they are influenced markedly by the company structure and the degree of profit dependence on new products and processes (Whitley and Frost, 1971).

The only empirical effort in the research literature that identifies organizational effectiveness criteria in R & D organizations is by Mahoney and his colleagues (Mahoney, 1967; Mahoney and Weitzel, 1969; Mahoney and Frost, 1974). They factor-analyzed 114 variables derived from the literature and developed independent criteria dimensions of organizational effectiveness for research and development units as well as a general business setting. The R & D model was developed separately from the general business model in order to provide contrast so that the construct space of organizational effectiveness could be looked at more critically.

The Construct of Organizational Effectiveness

The construct of organizational effectiveness can be confusing. Problems arise when one tries either to define the term or measure the phenomenon. If we understood the

factors involved in organizational effectiveness we would be able to utilize personnel better, to plan for that utilization, and to design more effective employee incentive and performance and appraisal systems. The difficulties are in identifying the factors that lead to improved organizational effectiveness in linking cause and effect, and in identifying the operational criteria of effectiveness. In general, to improve effectiveness means to improve the ratio of the quality and quantity of services provided to the resources consumed. As we attempt to achieve a more concise definition, we find that the term means many things to many people.

Cameron (1981b) identifies three major characteristics of organizational effectiveness that have contributed to the difficulty in defining or identifying agreed-upon indicators of the construct. First, because organizational effectiveness is a construct, it cannot be observed directly. It cannot be pinpointed, counted, or objectively specified. Further, the construct space of organizational effectiveness has never been fully mapped; different criteria can serve as indicators of effectiveness even though they are unrelated or contradictory; e.g., both efficiency (an absence of slack) and adaptability (the availability of slack) may be indicators of effectiveness.

Second, Cameron states that organizational effectiveness as a construct is inherently subjective and is grounded in the values and preference of individuals. The bases for evaluating effectiveness are the individual preferences of constituencies. Arriving at communal preferences or criteria of effectiveness for an entire organization is very difficult where diverse or numerous constituencies exist.

Third, Cameron states that the definitions of organizational effectiveness are ambiguous. There are a variety of conceptualizations of what an organization is and how it can differ under varying circumstances. As the definition of an organization changes, so does the definition of what makes an organization effective. No standard set of criteria is available with which to evaluate effectiveness in organizations because, Cameron says, no standard organization exists.

Previous Research on Organizational Effectiveness

As noted by Steers (1975), research on organizational effectiveness has utilized both univariate and multivariate models. Univariate models use one measure of organizational success as indication of effectiveness. The most widely used variables have been: overall performance, measured by employee or supervisor; productivity,

measured by output data; profit or rate of return, based on accounting data; and withdrawal, based on turnover and absenteeism data.

The multivariate models attempt to focus on relationships between important variables as they jointly influence organizational success. They are generally more comprehensive and attempt to account for a greater proportion of the variance in effectiveness. They also try to demonstrate how the variables under study are related to one another. Some models represent a priori theoretical statements, but many are based on or, at least, related to empirical research.

Previous research on organizational effectiveness clearly demonstrates a lack on consensus as to what constitutes a useful and valid set of effectiveness measures. There is very little overlap across the various studies (Cameron, 1978a; Steers, 1975).

Different results are also found according to whether research approaches the evaluation criteria from a static or a dynamic framework. A static framework perceives effectiveness as a state which organizations strive to attain; in other words, once an organization acquires certain characteristics it becomes effective. The dynamic perspective sees effectiveness in terms of the entire organizational system. Being in a constant state of flux,

the organization is continually trying to reach and maintain a state of balance with respect to its internal and external environments.

Most models use normative evaluation criteria, but there are some that use descriptive criteria. Normative or prescriptive criteria attempt to specify those things an organization must do to become effective. They attempt to prescribe criteria based on either theoretical formulations or value premises. These become the conditions under which an investigator or manager should be able to determine the degree of effectiveness of a particular organization. Descriptive criteria summarize the characteristics already in place in an organization. They take a more empirically based approach, usually describing the characteristics that emerge as a result of the investigation. In most cases, such descriptions do not carry normative implications.

Most research has taken a universalistic approach. The claim is made that evaluation criteria can be applied to a wide variety of organizations. In other words, there is an assumed generalizability or external validity. Some of the research, however, has narrowed criteria down to a type of organization, most often business organizations.

There are two basic approaches in the derivation of evaluation criteria. The first is deductive, where the

criteria are identified in advance by definition or as part of a proposed theory. The second is inductive, where the evaluation criteria are determined as the result of findings in one or more empirical studies. Inductive criteria generally have the advantage of not making specific assumptions about the findings until the data themselves are analyzed. By the same token, they typically fail replication within a predictive design framework (Steers, 1975).

Cameron (1978a, 1978b, 1980, 1981b) identifies four different approaches used by researchers to define and assess organizational effectiveness. The most widely used approach has been the Goal Achievement Approach. Organizational effectiveness is defined in terms of the extent to which a company accomplishes its goals. Its focus is on the output of a facility; the more a firm's output approximate its goals, the more effective it is.

The Systems Resource Approach defines effectiveness in terms of the extent to which a firm acquires needed resources; the more of the needed resources a company can obtain from its external environment, the more effective it is. Therefore, the focus of this approach is an organizational input or achievement of a competitive advantage the marketplace.

The third method identified by Cameron is the Internal Processes and Operations Approach, which defines effective organizations as those with an absence of internal strain, whose members are highly integrated with the system, whose internal focusing is smooth and typified by trust and benevolence toward individuals, where information flows smoothly vertically and horizontally. Thus, according to the process approach, organizational effectiveness is defined in terms of a healthy system.

The final approach to the study of organizational effectiveness is Strategic Constituencies Approach or the Participant Satisfaction Model. This approach defines effectiveness as a function of the satisfaction level of a firm's strategic constituencies. A strategic constituency is defined as a group of individuals who have some stake in the organization (i.e., resource providers, users of the company's products or services, producers of the company's output, groups whose cooperation is essential for survival of the company or whose lives are significantly affected by the company).

Thus, according to Cameron, the goal approach is useful when the firm's goals are clear, consensual, and measurable, and the company's environment is relatively stable. The systems resource model is useful when there is a clear connection between resources received by the

firm and what the firm produces. The process model is most appropriate when the internal processes of a company are closely associated with what the company produces or its primary task. The strategic constituencies approach is most appropriate when external constituencies have powerful influence on what a firm does or when a firm's actions are largely reactive to strategic constituency demands.

R & D Units as Organized Anarchies

In general, one or more of these four approaches is applicable to the overall assessment of most types of companies. However, because of the unique characteristics of research and development, none of these measures of effectiveness is entirely appropriate in specifically assessing R & D facilities. The organizational characteristic of R & D units negate the criteria that are central in each of these approaches.

Cameron (1980) notes that there is a class of organization for which none of the four identified approaches to evaluating effectiveness is appropriate. He refers to the class of organizations as organized anarchies. They encompass such organizations as schools, colleges and universities, large service companies, business conglomerates, political campaign organizations, many government

bureaus, and research and development facilities.

(Cameron has primarily focused his research on organizational effectiveness in colleges and universities.) There are few common structures or linkages which flow through organized anarchies to bind the subunits together. Either the most common linking pins--the technology or method of doing work, common purposes and goals, and the formalized hierarchy of authority--are not present in organized anarchies, or their linking power is weak.

Some of the important common characteristics of organized anarchies are:

- (1) Goals are generally ill-defined, complex, changing, and contradictory. Subunits are frequently pursuing goals that may be unrelated to the broader, more general organizational goals.
- (2) Means-end connections are not clear. That is, there is no obvious connection between technology or the way work is done and the outcome. In research and development it is difficult even to identify a successful outcome, let alone find agreed-upon means for accomplishing that outcome.
- (3) Similarly, in organized anarchies the same outcome may be produced by more than one technology or strategy.

- (4) There is little or no feedback from the output to the input, and little feedforward from input to output, so that the causal connections between the two are not testable. That is, in R & D facilities (unlike the classic open-systems model) there is no feedback loop.
- (5) Because subunits are not tightly connected, influences from the external environment are partitioned among them, and all but a small subset of factors can be ignored. Monitoring of the broader environment and the organization's multiple constituencies need not occur in any one subunit. "Let someone else handle that", is a common strategy. Moreover, turbulence from external forces seldom diffuses throughout the entire organization because of the autonomous nature of the subunits. Trouble spots are largely contained within one of a few organizational subunits.
- (6) Widely differing criteria of success may be operating simultaneously in various parts of the organization. Pursuit of success in one part of the organization may even inhibit success in another part of the organization. Trade-offs of

excellence among research, publishing, and training are examples.

- (7) The connection between the organizational structure and the activities of R & D units is often ambiguous. That is, it is not unusual to find rigid structures and hierarchies (such as strict professional ranking and formalized departmental divisions) imposed upon a rather fuzzy operating process.

None of Cameron's (1981b) four major approaches to defining and evaluating organizational effectiveness are applicable by themselves to R & D settings. As he suggests, reliance on the goal achievement approach is most appropriate when goals are identifiable, specific, consensual, measurable, and time bound; in other words, when goal attainment can be measured. In R & D facilities, these conditions are often not present. Vague, ambiguous criteria of effectiveness serve to keep R & D units adaptable, flexible, and able to respond to a wide diversity of expectations and demands. Moreover, vague evaluation criteria serve as a unifying force in an otherwise loosely organized set of subunits. A wide variety of subunit goals can be related to a set of highly ambiguous evaluation criteria.

The second, systems resource, approach is not sufficiently applicable to R & D. No clear causal connection exists between input, or the resources an R & D facility receives, and output, or production level. The ability to obtain resources that are not subsequently used by the organization would not indicate effectiveness. For example, the funding formula or budget, e.g., input, for many R & D units is not based on the accomplishment of the primary task or on the level of output; rather, it is based largely on what was budgeted during the previous fiscal year, and how much of that was spent. The causal association between organizational input and organizational output in many R & D units is also ambiguous. Because both feedback and feedforward loops are largely absent, the system resource approach appears not to be an appropriate model.

Third, the usefulness of the process approach as an exclusive methodology depends on an acknowledged relationship between internal processes in the organization and the desirability of outcomes. That is, there should be a connection between the technology used and the manner in which the technology is are organized with the organizational outcomes. Smooth processes and internal health that do not produce an output would not indicate effectiveness. Again, in R & D units the same outcome may be

produced by more than one technology. There is often little information flow between widely varying organizational characteristics and the product of the organizational effectiveness does not meet the criteria for evaluating R & D facilities.

The fourth major approach, the strategic constituencies approach, is most appropriate when external groups have major influence on organizational functioning. When organizational behavior reacts largely to the demands and expectations of strategic constituencies, this approach is highly appropriate for defining and evaluating effectiveness. The presence of loose coupling and semi-autonomous subunits in R & D organizations, however, are precisely the mechanisms used to limit power of external groups as they relate to the organization. One function of loose coupling is to serve as a buffer against environmental encroachment. Loosely coupled subunits need only respond to a small part of the total environment, and the impact of any single constituency is generally confined to a small portion of the total organization. In R & D units, therefore, the influence of external constituencies is limited by the nature of the organizing process and resulting structure.

Research Objectives

Inasmuch as no previous research had provided appropriate criteria for assessing effectiveness in research and development facilities, the major question of this study was whether it was possible to measure organizational effectiveness in R & D organizations.

The purpose of this research was to generate meaningful criteria and develop a descriptive model of effectiveness for research and development facilities by (1) identification of the major factors that predict increases and decreases in certain aspects of effectiveness in this setting; (2) instrumentation for defining and measuring organizational effectiveness in R & D settings; and (3) formulation of descriptive models that may be useful to managers in R & D settings in evaluating the effectiveness of their organizations.

C H A P T E R I I

RESEARCH METHODOLOGY

The entire research process consisted of six steps. The first step was to generate variables of organizational effectiveness in R & D settings. This was achieved by combining three sources of organizational effectiveness data: Mahoney's (1967) list of 114 variables of organizational effectiveness derived from both an extensive literature search and interviews with practicing managers; Cameron's (1978b) 130 variables of organizational effectiveness developed through a search of the social science literature; and the author's list of organizational effectiveness variables gathered from the literature on R & D management. This combined list of organizational effectiveness criteria contained 168 items (Appendix 1).

The second step in the research process was to conduct interviews with managers of R & D facilities in order to define the construct space of organizational effectiveness in R & D facilities. R & D managers were selected in this research as being the most appropriate source of information for two reasons (Cameron, 1978b). First, an organizations' major decision makers should be the source of organizational effectiveness criteria and measurement

since it is they who allocate resources, determine organizational policy, and explicate organization goals. This is the group most likely to specify both the cause and effect relationships within the organization and the hierarchy of outcomes preferred.

The second reason is that the manager will be the major user of effectiveness information. Type 3 errors--solving the wrong problem with the right methods--can be avoided only if users of organizational effectiveness information are included as sources.

A sample of 400 R & D managers was generated from four sources:

1. The membership list of the Industrial Research Institute, an association founded in 1938 with the purpose of studying problems confronting managers of industrial research and development. The I.R.I. has 278 member companies.
2. Business Week's 1981 annual list of industrial research and development expenditures in the United States. The list contained 744 companies having annual sales of more than \$35 million that spent more than \$1 million on R & D, or an amount equal to 1% of their sales.
3. The author's network of professional contacts.

4. The 17th edition (1982) of Industrial Research Laboratories of the United States, containing information on 9,958 R & D facilities belonging to 6,254 organizations.

Research and development managers were initially contacted by letter (Appendix 2). A follow-up telephone call was made to answer questions about the study and to set up an interview date.

The managers were asked to respond to the following questions during the interview:

1. Think of an R & D organization that you judge to be effective. What is it that makes that organization effective?
2. What organizational characteristics do effective R & D organizations possess?
3. What is the most important factor(s) in determining the effectiveness of the organization? Is it a person?
4. How do you judge your organization's effectiveness?
5. What is there at your organization that makes a difference in terms of its effectiveness?
6. What would have to change in order to make this organization more effective?

7. Of the 168 items generated from the literature, which ones are not relevant to the effectiveness of this organization?

A total of eight managers selected from the sample population were interviewed, resulting in the identification of 131 items comprising the construct space or mapping of the construct of organizational effectiveness in R & D settings.

The third step in the research process was conducted in order to achieve a better understanding of this newly defined construct space. The variables were grouped into three broad categories, namely causal, intervening and end-result (Likert, 1967, p. 136).

The causal variables are independent variables that determine the course of development within an organization and the results achieved by the organization. These causal variables include only those independent variables that can be altered or changed by the organization and its management. General business conditions, for example, although an independent variable, is not included among the causal list. Causal variables include the structure of an organization and its management's policies, decisions, business and leadership strategies, business and leadership strategies, skills and behavior (Likert, 1967, p. 26-29).

The intervening variables reflect the internal state and health of the organization, e.g., the loyalties, attitudes, motivations, performance for effective interaction, communication, and decision making (Likert, 1967, p. 29). The intervening variables can be divided into two broad subcategories: (1) the intervening attitudinal, motivational and perceptual cluster and (2) the intervening behavioral cluster. These two subcategories merge into one another (Likert, 1967, p. 140).

The end-result variables are dependent variables which reflect the achievements of the organization, such as its productivity, costs, scrap loss, and earnings (Likert, 1967, p. 29).

Grouping the variables resulted in a reduction of the number of items from 131 to 113. The result was 37 causal variables, 63 intervening variables and 13 end-result variables.

The fourth step in the research process was to develop an instrument which asked respondents to describe the extent to which their R & D unit had certain organizational characteristics.

The fifth step of the research process was the pretest of the instrument. The questionnaire was administered in person to five managers selected from the sample population. These individuals were first contacted

by letter. A follow-up phone call was made to answer questions about the study and to set up an interview date. Input from the managers resulted in the rewording of several parts of the instrument.

The revised instrument contained ten sections (Appendix III). Sections I and X contained demographic inquiries; Sections II and IV contained the same question. Both asked the respondent's perception of the effectiveness of his R & D unit; Sections III-VII contained the causal and intervening items (100 questions); and Section VIII contained the end-result items.

The sixth step of the research process was the administration of a mail survey. On July 27, 1982, the instrument, a cover letter, and a stamped, return envelope was sent to the sample of 400 R & D managers (Appendix IV). Anonymity for all respondents was guaranteed and feedback reports containing the aggregated results were offered to those who requested them.

On August 11, follow-up post cards were sent to survey recipients who had not returned the questionnaire (Appendix J). During the first three weeks of September 200 follow-up phone calls were placed to those who had still not responded.

A total of 124 (31 percent return rate) usable responses were obtained from the mail survey and follow-up

efforts. The results and analysis of the data are contained in the following chapters.

In summary, the research process consisted of six steps:

- (1) Generation of organizational effectiveness criteria;
- (2) Interviews with eight R & D managers;
- (3) Grouping of items;
- (4) Development of survey questionnaire;
- (5) Pretest and refinement of instrument; and
- (6) Mail survey and follow-up.

C H A P T E R I I I

RESULTS

This chapter is presented in four sections. The first section describes the respondent population. The second section summarizes the data compilation of the thirteen end-result items and the "others" items from section VIII of the questionnaire.

The third section presents the eleven effectiveness dimensions and the statistical procedures used to examine the internal reliability and discriminant validity of the hypothesized dimensions.

The fourth and final section of the results chapter presents an examination of the construct validity of the proposed dimension.

The Sample

One hundred twenty-four useable questionnaires were returned and compiled, representing a 31% return rate. Forty industries are represented in the sample, with the highest concentration in chemicals, information processing and electronics (Table 1). (Note: The category 'Others' in Table 1 represents one-of-a-kind industries.) The size of the industries, in terms of number of employees, is evenly distributed (Table 2).

Table 1: Types of Industries Represented in Sample

	N
1. Chemicals	16
2. Electronics	13
3. Information Processing	12
4. Conglomerates	6
5. Food and Beverage	6
6. Machinery	6
7. Manufacturing	5
8. Oil Service/Supply	5
9. Paper	4
10. Drugs	4
11. Instruments	4
12. Metals and Mining	4
13. Personal/Home Care	3
14. Steel	3
15. Tire and Rubber	3
16. Aerospace	3
17. Telecommunications	3
Others	23
No Answer	1

Total 124

Table 2: Total Number of Employees in Entire Company

	N	%
1,000 or fewer	18	15.0
1,001 to 5,000	29	24.2
5,001 to 10,000	10	8.3
10,001 to 25,000	18	15.0
25,001 to 50,000	14	11.7
50,001 or more	31	26.5
No Answer	4	
Total	124	100%

The size of the R & D units, in terms of number of employees, is also fairly evenly distributed (Table 3).

The primary work done in the units is research, development and engineering. An 'other' category was included for units which have additional responsibilities (Table 4).

Seventy-five percent of the units were engaged solely in R & D for a parent organization. The remainder of the units were engaged in one or more of the following activities: R & D for parent organization; contract work for the government; contract work for industry; and consultation for others (Table 5).

Table 3: Total Number of Employees in R & D Unit

	N	%
50 or fewer	31	25.2
51-100	24	29.5
101-150	10	8.1
151-200	12	9.8
201-400	20	16.3
401-600	8	6.5
601 or more	18	14.6
No Answer	1	
Total	124	100%

Table 4: Kinds of Work Done In the R & D Units

Research	Development	Engineering	Other	N	%
X	X	X		39	31.5
X	X			35	28.2
X	X	X	X	12	9.7
X				10	8.1
	X	X		9	7.3
X	X		X	6	4.8
	X			5	4.0
	X		X	2	1.6
		X		2	1.6
			X	2	1.6
X			X	1	0.8
X		X		1	0.8
TOTAL				124	100%

Table 5: Primary Activities of the R & D Units

R&D For Parent Organization	Contracts for Government	Contracts for Industry	Consulta- tion for Others	N	%
X				93	75
	X			9	7.3
X	X			9	7.3
	X	X		3	2.4
X	X	X	X	3	2.4
			X	3	2.4
X	X	X		3	2.4
X		X	X	1	0.8
TOTAL				124	100%

The respondents in the study were all managers in R & D settings. Over 98% of them were males (Table 6). Almost 70% were over the age of 45 (Table 7). Over 63% of the respondents had a doctoral degree, and none had less than a four year college education (Table 8). Over 65% of the sample had formal training in management (Table 9).

Table 6: Respondents' Sex

	N	%
Male	118	98.3
Female	2	1.7
No Answer	4	
Total	124	100%

Table 7: Respondents' Age

	N	%
35 or under	9	7.4
36-45	28	23.0
46-55	52	42.6
56 or above	33	27.0
No Answer	2	
Total	124	100%

Table 8: Respondents' Education Level

	N	%
Bachelor's	17	13.8
Master's	28	22.8
Doctorate	78	63.4
No Answer	1	
Total	124	100%

Table 9: Respondents' Formal Training in Management

	N	%
Yes	79	65.8
No	41	34.2
No Answer	4	
Total	124	100%

End Result Variables

Table 10 contains a summary of the results of the responses for the end-result variables (Section VIII of the questionnaire (see Appendix III). The variables are arranged in order, with the highest mean response first. Listed also are the variance and kurtosis.¹

¹Kurtosis is a measure of the relative peakedness or flatness of the curve defined by the distribution of cases. A normal distribution will have a kurtosis of zero. If the kurtosis is positive, then the distribution is more peaked (narrow) than would be true for a normal distribution, while a negative value means that it is flatter.

Table 10: Mean Frequencies of Usage of End-Result Variables as Indicators of Performance

	Mean	Variance	Kurtosis
1. Quality of output or performance	5.752	1.371	2.725
2. Unit's degree of goal attainment	5.715	1.009	0.772
3. Amount of work done on time	5.073	1.511	1.040
4. Unit's level of efficiency	4.561	2.257	-0.550
5. Percentage of project completions	4.504	2.652	-0.520
6. Percentage of results adopted by company	4.347	2.562	-0.728
7. Frequency of cost overruns	3.746	3.166	-0.984
8. Number of patents or copyrights	3.699	3.032	-1.136
9. Percentage of project approvals	3.380	3.504	-1.330
10. Number of technical reports produced	3.325	2.729	-1.034
11. Unit Profitability	3.083	4.094	-1.213
12. Number of papers presented at professional meetings	3.057	2.808	-1.034
13. Number of professional rewards or honors	2.992	2.587	-1.168

Table 11 contains a summary of the "Other" category listed as the last item in Section VII of the questionnaire (Appendix III). Twenty-nine "other" responses were tabulated representing twenty additional end-result categories.

Table 11: Additional Measures of Performance
Utilized by Respondent Organizations

<u>N</u>		
1.	4	Proposals funded or contracts obtained
2.	4	Sales of products/business projects
3.	2	Adequacy of consulting efforts
4.	2	Image, credibility and confidence of unit
5.	2	Coordination with other units/divisions
6.	1	Growth
7.	1	Increases in revenues
8.	1	Getting budgets approved
9.	1	Community contributions/participation
10.	1	Equal opportunity
11.	1	Recovery of costs
12.	1	Quality of strategic plans
13.	1	Number of new product introductions
14.	1	Creativity or innovation (non-patent)
15.	1	Projects translated into reduced costs
16.	1	Enhancement of product performance
17.	1	Communications and documentation
18.	1	Ratio of direct labor to overhead labor
19.	1	Cost content of product
20.	1	Successful product developments

29 Total

Dimensions of Effectiveness

A test for statistical independence of the covariance structure² demonstrated a high degree of dependence among the responses ($p < .001$). Five of the questionnaire items were found to have low correlation ($< .20$) with all other items. These items were not included in further analyses of the data.³

The resulting variables were assumed to be a fairly extensive accumulation of measurable effectiveness items. Certain clusters of items were apparent and eleven groupings of variables or effectiveness dimensions emerged (see Appendix VI). Several alternative groupings were tried, but the eleven dimensions represented the only categorical scheme which encompassed all of the effective criteria.

The eleven clusters of variables were the result of an interactive conceptual and statistical process which took over three months to complete. Through this process, which involved a careful study of the intercorrelations of the effectiveness items, groupings which made conceptual sense and also had high intercorrelations were identified.

²Refer to Morrison (1967, pp. 111-114) for an explanation of the procedure.

³These items were: the geographic location of the unit; degree of conformity of employee attitude, behavior and beliefs; frequency of push, follow-up and checking required; spread of abilities among individuals; and degree of mechanization.

Factor analytical procedures were also utilized to help to identify variable groupings.

From this step-wise, iterative procedure eleven groupings emerged. They made sense as individual constructs and each grouping was also fairly highly inter-correlated. Further, the eleven groupings made conceptual sense as the dimensions which comprise the construct space of organizational effectiveness in R & D settings.

Labels or names were given to each of the dimensions. The labels represented the properties of each of the dimensions rather than individual items. In other words, if some items in a grouping had a certain property, the other items in the grouping were expected to have the same property. Thus, all items in the same grouping were given the same name.

The dimensions represented conceptually different constructs although they are not assured to be independent. The eleven effectiveness dimensions were:

1. Organizational Synergy - containing criteria indicating the extent to which the unit is integrated into the overall management and operation of the entire company.
2. Unit Health - containing criteria indicating the general stability and health of the unit as well

as the commitment and attitude of the unit's employees.

3. Information Flow Within Unit - containing criteria indicating the effectiveness as well as the general patterns of communication and decision making within the unit.
4. Employee Career Development - containing criteria indicating recognition, emphasis and provision of employee career development activities.
5. Unit Adaptability - containing criteria indicating the unit's ability to respond quickly to novel circumstances.
6. Employee Professional Development - containing criteria indicating the existence of support and emphasis for the professional development of the unit's employees.
7. Unit Creativity - containing criteria indicating the unit's ability to deal with difficult and unusual circumstances.
8. Cooperation Within Unit - containing criteria indicating the degree of cooperative behavior within the unit.
9. Employee Motivation - containing criteria indicating the recognition of practices which aim to increase employee commitment to achieve the work.

10. Degree of Unit's Work Efficiency - containing criteria indicating the level of efficiency in the work done in the unit.
11. Achievement Recognition Within the Unit - containing criteria indicating the existence of reward systems for individual and group output.

Table 12 lists the items comprising each of the effectiveness dimensions.

At this point in the research process, a set of effectiveness criteria had been identified and categorized into eleven separate dimensions. The primary task of the study now became one of determining if the proposed effectiveness dimensions were reliable and valid.

Coefficient alpha⁴ was applied to test the internal consistency reliability of the effectiveness dimensions and acceptable levels of reliability were found for each of them. Nunally (1967) suggested that for exploratory research, a reliability of between .50 and .60 is acceptable, and the lowest reliability coefficient among the eleven effectiveness dimensions was .597 while the highest was .895.

⁴According to Nunally (1967), coefficient alpha is the basic formula for determining the reliability based on internal consistency, and even if other estimates of reliability are made, coefficient alpha should be obtained first. For a detailed explanation of coefficient alpha as well as an explanation of its calculations, refer to Nunally (1967, pp. 196-198, 210-211).

Table 12:
Items Constituting the Eleven Effectiveness Dimensions

Effectiveness
Dimensions

	<u>Items</u>	<u>Factor Loadings</u>	
1. Organiza- tional Synergy	X0101	.313	Coordination of work with other units
	X0102	.667	Degree to which company management accurately perceives unit effectiveness
	X0103	.486	Degree of achievement recognition unit receives
	X0104	.316	Quality of support functions within unit
	X0105	.252	Degree of long-term planning and goal setting within unit
	X0106	.546	Interdepartmental relations
	X0107	.731	Health of entire company
	X0108	.725	Flexibility of company management
	X0109	.590	Level of performance goals unit is expected to achieve
	X0110	.410	Unit employees' attitudes towards company and its goals
	X0111	.476	Degree to which unit supervisor has "ear" of top management
	X0112	.690	Degree to which company management understands unit's needs
	X0113	.502	Degree of unit's integration with entire company
	X0114	.427	Effectiveness of inter- departmental communication

2. Unit Health	X0201	.430	Unit's ability to obtain resources
	X0202	.346	Process of filling vacancies within unit
	X0203	.444	Unit employees' degree of satisfaction with their professional growth and development as a result of their work experiences
	X0204	.380	Unit employees' degree of satisfaction with their salary levels
	X0205	.587	Unit employees' degree of satisfaction derived from working in unit
	X0206	.533	Degree of unit's sense of identity
	X0207	.581	Degree of unit's stability
	X0208	.548	Degree to which employees understand the unit's goals and objectives
	X0209	.635	Degree of employee psychological commitment to unit
	X0210	.402	Unit employees' comfort in physical work environment
	X0211	.646	Degree to which employees feel that they are effectively contributing to the work of the unit
	X0212	.522	Degree to which unit employees' career goals are met
	X0213	.408	Unit's degree of control over its environment
	X0214	.458	Degree of unit supervisor's understanding of the jobs in his or her areas

3. Information Flows Within Unit	X0301	.431	Equity of treatment and rewards within unit
	X0302	.324	Extent to which review and control functions are concentrated within unit
	X0303	.376	Extent to which superiors have confidence and trust in subordinate within the unit
	X0304	.452	Extent to which subordinates have confidence and trust in superiors within the unit
	X0305	.356	Level at which decisions are finally made within unit
	X0306	.673	Direction of information flow within unit
	X0307	.665	Extent to which superiors willingly share information within unit
	X0308	.567	Extent to which communications are willingly accepted by subordinates within unit
	X0309	.588	Adequacy of upward communication
	X0310	.539	Level of responsibility employees feel for initiating upward communication within unit
	X0311	.274	Accuracy of upward communications within unit
	X0312	.563	Adequacy and accuracy of horizontal communication
	X0313	.454	Amount of cooperative teamwork within unit
	X0314	.541	Extent to which employees are involved in decisions related to their work within unit

	X0315	.274	Employees' attitudes towards other members of the unit
	X0316	.356	Level of supervisors' confidence in their ability to supervise
	X0317	.427	Level of supervisor awareness of how well their performance meets company's standards
	X0318	.467	Range of responsibilities assigned to individual positions
4. Employee Career Development	X0401	.431	Emphasis on activities outside work to enhance employees' personal development
	X0402	.494	Rewards and encouragement for role performance
	X0403	.483	Management training and skills of supervisors within unit
	X0404	.584	Amount of career development activities provided for employees within the unit
	X0405	.629	Number of employees who participate in activities to enhance their communication skills
	X0406	.736	Number of employees who receive career counseling
	X0407	.585	Adequacy of resources to assist in training subordinates
	X0408	.354	Degree of employee involvement in unit goal setting

5.	Unit Adapt- ability	X0501	-.368	Degree of consistency of methods and practices among supervisors
		X0502	-.329	Level of resistance to change
		X0503	.369	Degree to which unit can be counted on to come through under pressure
		X0504	-.544	Amount of time lost and wasted through indecision
		X0505	-.681	Amount of time and effort wasted because of poor internal coordination
		X0506	-.481	Amount of "dead weight"
6.	Employee Profes- sional Develop- ment	X0601	.344	Emphasis on employees engaging in academic activities outside company
		X0602	.326	Emphasis on employees engaging in professional activities outside company
		X0603	.329	Number of individuals not associated with unit who serve on projects
		X0604	.660	Number of unit employees who have national reputations in their fields
		X0605	.584	Number of unit employees engaging in extra work and study related to their jobs over and above what is specifically assigned
		X0606	.736	Number of unit employees who work at the "cutting edge" of their fields
		X0607	.291	Number of unit employees in school
		X0608	.596	Number of unit employees who attend professional meetings

7. Unit Creativity	X0701	.494	Unit's intellectual environment
	X0702	.471	Degree to which unit deviates from established policy and standard procedure
	X0703	-.221	Degree to which detailed routines are set up for operations
	X0704	.391	Degree to which results rather than procedure are emphasized
	X0705	.562	Emphasis on creativity
	X0706	.625	General style of supervision
	X0707	.313	Degree of readiness to tackle unusual problems
	X0708	.364	Amount of supervisory freedom to take action
	X0709	.348	Levels of competence and skill of individuals
8. Cooperation Within Unit	X0801	.520	Extent to which the unit has people centered atmosphere
	X0802	.322	Degree to which the unit initiates improvements in work methods and operation
	X0803	.465	Degree to which the unit accurately perceives its environment
	X0804	.437	Person in the unit's supervision position
	X0805	.426	Degree of resolution of conflicts and disagreements
	X0806	.481	Amount of conflicts and friction

9. Employee Motivation	X0901	-.292	Degree to which personnel assignments are based on tenure
	X0902	.392	Degree to which personnel assignments are based on skill and expertise
	X0903	.369	Degree of focus on the achievement of the unit's goals
	X0904	.341	Degree of change of individual job duties and responsibilities
	X0905	.521	Degree of interdependence of the work done in the unit
	X0906	.252	Number of employees who have a positive perception of their self-image
	X0907	.378	Number of employees who are challenged by their work assignments
	X0908	.293	Amount of interaction within the unit aimed at achieving the company's objectives
10. Degree of Unit's Work Efficiency	X1001	.719	Amount of time spent on projects unrelated to the major objectives within unit
	X1002	.678	Number of activities not related to work engaged in by unit employees
11. Achievement Recognition Within Unit	X1101	.514	Existence of reward and recognition systems for individual output
	X1102	.458	Existence of reward and recognition systems for group output

Table 13: Internal Consistency Reliability
for the Effectiveness Dimensions

Dimension	# of Items	Coefficient Alpha
1. Organizational Synergy	14	.889
2. Unit Health	14	.875
3. Information Flows Within Unit	18	.895
4. Employee Career Development	8	.797
5. Unit Adaptability	6	.618
6. Employee Professional Development	8	.770
7. Unit Creativity	9	.675
8. Cooperation Within Unit	6	.718
9. Employee Motivation	8	.597
10. Degree of Unit's Work Efficiency	2	.785
11. Achievement Recognition Within Unit	2	.765

Table 13 reports the internal consistency reliability for each of the dimensions.

Factor analytic procedures also largely confirmed the interval consistency of the dimensions. Oblique, quartermax, varimax and equimax rotations were used as well as a limitation of the number of factors produced to

between six and twelve to try to find any underlying dimensions. Appendix VII presents the results of the varimax rotated factor structure. Table 12 also shows factor loadings for the items comprising each of the the eleven effectiveness dimensions.

Average within-dimensions correlations for each item were compared to the mean correlations of each item with all items outside its own effectiveness dimensions as one test of the discriminant validity of the items. It was found that within-dimensions mean correlations were higher than the mean outside correlations for every item. As reported in Appendix VIII, these findings confirm that the dimensions are composed of items with high internal consistency and that they distinguish one dimension from another.

Further, after computing the median correlation coefficient for all items within a dimension, correlations between the dimension and all outside items were inspected to determine where overlaps among items occurred. The purpose was to uncover the effectiveness items which correlated highly with more than one dimension, and to determine which dimensions had overlapping items. Only six items of the ninety-five inspected were found to have an inter-scale correlation higher than its intra-scale median correlation (see Appendix IX)

A between dimension correlation matrix displayed on Table 14 showed that the effectiveness dimensions were not highly related and that the degree of interdimensional correlation was not high enough to blur individual distinctiveness.

Table 14: Inter-Dimension* and Intra-Dimension** Correlation Matrix

***	1	2	3	4	5	6	7	8	9	10	11
1.	.405										
2.	.263	.395									
3.	.219	.246	.372								
4.	.199	.165	.137	.416							
5.	.210	.227	.275	.132	.456						
6.	.125	.110	.108	.114	.085	.388					
7.	.190	.193	.192	.126	.165	.169	.335				
8.	.171	.224	.209	.162	.222	.105	.160	.419			
9.	.222	.216	.215	.159	.195	.096	.150	.177	.344		
10.	.088	.075	.059	.121	.136	.179	.079	.107	.080	.824	
11.	.293	.270	.146	.262	.146	.184	.190	.196	.147	.052	.811

*Inter-dimension correlation coefficients are the mean absolute values of the intercorrelation between all items in one dimension and all items in another dimension.

**Intra-dimension correlation coefficients are the mean absolute values of the intercorrelation of all items within a dimension.

*** Dimensions

1. Organizational Synergy
2. Unit Health
3. Information Flows
4. Employee Career Development
5. Unit Adaptability
6. Employee Professional Development
7. Unit Creativity
8. Cooperation Within Unit
9. Employee Motivation
10. Unit's Work Efficiency
11. Achievement Recognition

A test of significance was performed between the mean-inside and mean-outside scale correlations for all of the dimensions. The results are shown in Table 15.

In sum, the analysis of the data provide support that the dimensions bore acceptable internal consistency reliability as well as discriminant validity.

At this point in the research process some indication of validity was needed in order that follow-up research could prove meaningful and worthwhile.

Construct Validity

An indication of validity was found by comparing scores on the eleven effectiveness dimensions between units who were perceived as more and less effective by the respondents.⁵ Figure 1 shows that each R & D unit perceived as effective scored higher on each of the dimensions than did those units perceived by managers to be less effective. The differences on eight of the eleven dimensions were significant at the .10 level or lower. The differences on only one dimension - Employee Professional Development - were not significant.

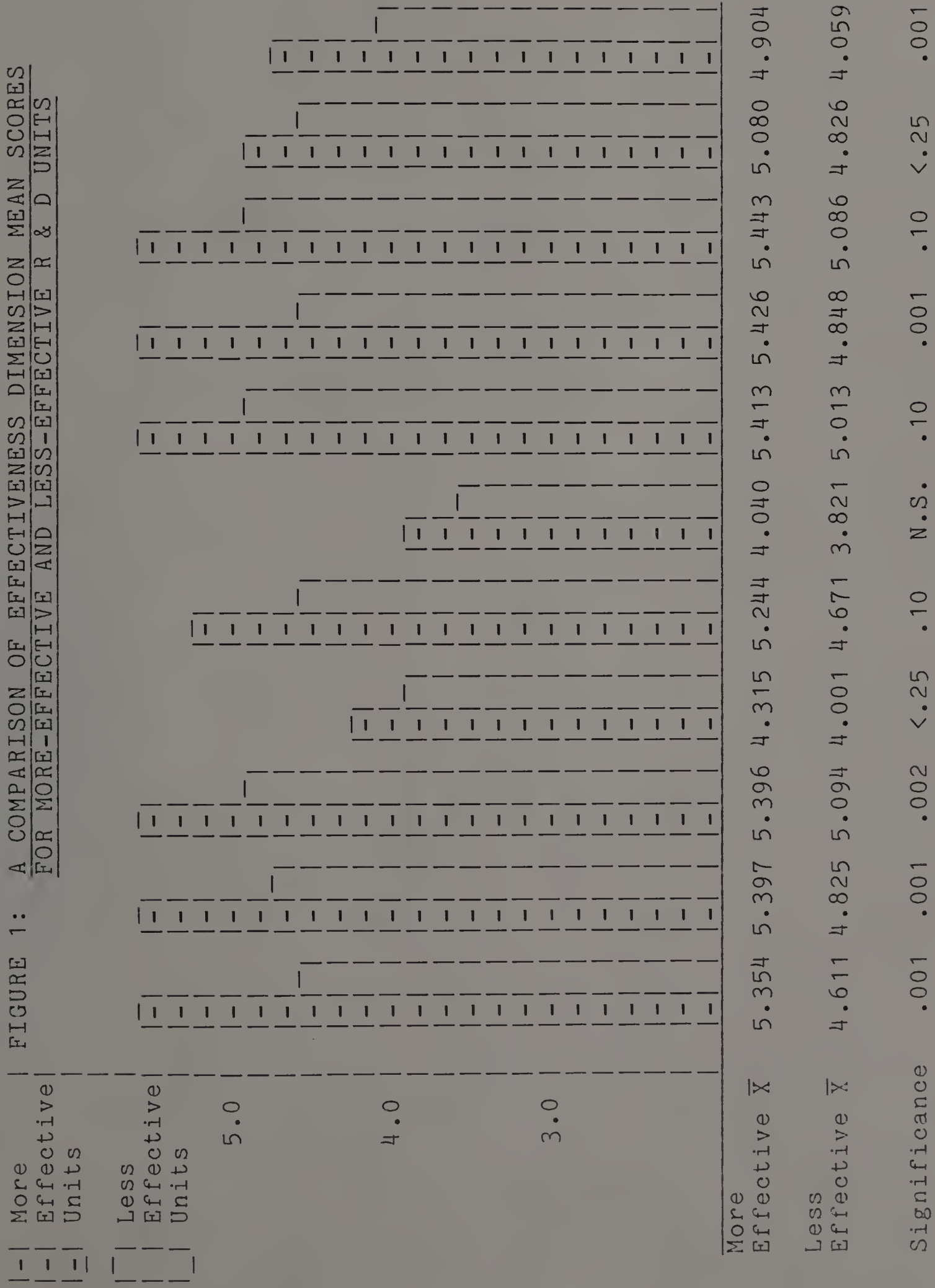
⁵Two questions on the instrument asked the respondents to rate their unit's effectiveness. No difference was found in the responses to the two questions. A distinction was made between a more-effective unit and a less-effective unit by those who scored above and below the mean score.

Table 15: Differences Between Intra-Dimension Average Correlations and Inter-Dimension Average Correlations*

Dimension	Intra	Inter	Signif- icance
1. Organizational Synergy	.433	.210	.005
2. Unit Health	.412	.215	.009
3. Information Flow Within Unit	.387	.201	.002
4. Employee Career Development	.446	.155	.05
5. Unit Adaptability	.494	.202	.11
6. Employee Professional Development	.410	.121	.03
7. Unit Creativity	.350	.175	.14
8. Cooperation Within Unit	.448	.185	.14
9. Employee Motivation	.360	.190	.20
10. Degree of Unit's Work Efficiency	1.169	.093	.28
11. Achievement Recognition Within Unit	1.130	.209	.36

*The intra-dimension average correlations were found by transforming the average intra-dimension coefficients by Fisher's Z. The inter-dimension average correlations were found by transforming the average inter-dimension correlation by Fisher's Z. Significant differences were tested from the Z scores.

FIGURE 1: A COMPARISON OF EFFECTIVENESS DIMENSION MEAN SCORES
FOR MORE-EFFECTIVE AND LESS-EFFECTIVE R & D UNITS



In construct validity terms, these relationships between the effectiveness dimension and other external concepts in expected directions (i.e., more or less effective) gives some indication that with additional research it will be possible to build a framework for assuring construct validity for the effectiveness dimensions.

CHAPTER IV

DISCUSSION

This research proposed to study organizational effectiveness in research and development facilities. Its main intent was to develop a descriptive model of effectiveness in these settings. The major outcomes of the research were: (1) instrumentation for defining and measuring organizational effectiveness in R & D settings; (2) discovery of the major factors that predict increases and decreases in certain aspects of effectiveness in these settings; and (3) descriptive models that may be useful to managers in R & D settings in evaluating the effectiveness of their units.

The first step of the research process attempted to map the construct space of organizational effectiveness by generating the variables that constitute this space. This was achieved by using three sources of information: data from two previous investigations of organizational effectiveness (Cameron, 1978b); Mahoney, 1967) combined with this author's own research efforts. The results was a list of 168 criteria or variables representing the construct space of organizational effectiveness in R & D facilities (Appendix I).

This list of variables must be assessed as to its representativeness of the construct of organizational effectiveness. In other words, we wanted to examine the content validity of the list of criteria. Kerlinger (p. 458) argues that content validation consists eventually of judgment; alone, or with others, we judge the representativeness of the items.

In this light, the list of 168 criteria is a fairly good representation of the construct of organizational effectiveness, because the list was derived from two well received studies of the construct, supplemented by this author's review of the literature of R & D management.

The entire universe of subjects for this study are the managers of the 9,958 R & D facilities in the United States. In order to derive a sample from this universe, two sources were used to identify subjects: the membership list of the Industrial Research Institute, and Business Week's 1981 list of R & D expenditures in the United States. Four hundred managers of R & D facilities were identified from these two sources.

The question that must be addressed at this point is whether the sample of 400 R & D managers is representative of the larger population. If so, then the findings from the study can be generalized. If not, then the findings are germane to only 400 R & D managers.

In the final analysis, the answer to the question of the degree of representativeness or randomness of a sample is a judgment call. In the present case, the sampling was not random, but this is a very common problem in this type of research. The most obvious bias of the sample is that the respondents were chosen from selected groupings, but there is no real way at this point to know whether this will cause any problems in generalization of the findings. Further, we have very little information on the 276 subjects who did not respond to the questionnaire.

The second step of the overall research methodology was to conduct interviews with subjects from the sample.

At this point in the research process we were trying to identify the "set" of potential variables of organizational effectiveness in R & D facilities by using the perceptions of managers in R & D settings. In order to accomplish this task, the investigator conducted a series of interviews with sample subjects.

The interview was used as an exploratory device to identify the set of potential indicants of organizational effectiveness criteria in R & D settings. The interview process also helped to suggest the hypothesis that would be tested in the final steps of the research process. In other words, the interviews would provide the information

needed to suggest the hypothesis; i.e., the effectiveness dimensions.

The interview process was terminated after conducting eight interviews, when a consistent set of 131 items or variables of organizational effectiveness were identified. At this stage, the variables were grouped into three categories, namely, causal, intervening and end-result (Likert, 1967, p. 136). Grouping the variables into causal, intervening and end-result categories (Likert, 1967) resulted in a reduction of the number of items from 131 to 113.

It was assumed that these 113 variables were representative of the construct space of organizational effectiveness in R & D organizations and therefore represented a highly reliable basis for the development of a questionnaire. A questionnaire was developed, pretest and revision procedures were applied, and the final questionnaire was mailed (Appendices III & IV). Reminder postal cards were sent (Appendix V) and follow-up telephone calls were made. A thirty-one percent return rate of usable questionnaires was achieved.

For the sake of parsimony as well as possible future data analysis, the 113 organizational effectiveness items were separated into two groups. The first, comprising sections III through VII of the instrument, were the 100

causal and intervening items. The 13 end-result items made up section VIII of the questionnaire.

In the analysis and interpretation of the data, each group was considered separately. The causal and intervening items were utilized as the basis for the development of the eleven effectiveness dimensions; the end-result items, including a fourteenth item entitled "others", provided insight as to how organizational effectiveness was actually being measured in R & D settings. Appendix X shows the causal and intervening items which make up the eleven dimensions.

The Effectiveness Dimensions

An iterative process involving the use of correlational coefficients, management theory, common sense and trial and error resulted in eleven groupings of variables or effectiveness dimensions. They comprised 95 of the original 100 causal and intervening items. Statistical procedures largely confirmed the internal reliability as well as the discriminant validity of these dimensions. Further, an indication of the construct validity of the eleven dimensions was achieved by comparing scores between units that were perceived to be more effective than those that were perceived as less effective. The more effective units scored higher on each of the eleven dimensions than

the less effective units. Significant differences existed on eight of the eleven dimensions. The differences in only one dimension - Employee Professional Development - were not significant.

Linking to Previous Research

The findings of this research were a result of the application of a novel approach developed by Cameron (1978b) for assessing organizational effectiveness. He developed the methodology by studying organizational effectiveness in institutions of higher education and suggested that his approach could be applicable to other types of "loosely coupled" organizations, e.g., "organized anarchies" (Cameron, 1978a).

Cameron's findings indicated that organizational effectiveness in institutions of higher education consisted of nine dimensions: student educational satisfaction; student academic development; student career development; student personal development; faculty and administrator employment satisfaction; professional development and quality of the faculty; system openness and community interaction; ability to acquire resources; and organizational health. Although similarities exist between Cameron's findings and those of this research project, a content comparison of the results offers little meaning.

The objects and scope of study of each are quite different.

Nevertheless, the successful application of the methodology provides an important basis for discussion. To the best knowledge of the author, this research project represents the first attempt to replicate Cameron's methodology. From an academic standpoint, this dissertation confirms the usefulness of this novel approach to the study of organizational effectiveness.

A meaningful comparison of the results of this dissertation can be made with research conducted by Mahoney and his colleagues (Mahoney, 1967; Mahoney and Weitzel, 1969; Mahoney and Frost, 1974), where organizational effectiveness in R & D settings was found to have the most pronounced relationship with the following items: Reliability (meets major objectives without necessity of follow-up and checking); Cooperation (operations scheduled and coordinated with other organizations, rarely fails to meet responsibilities); Development (personnel participate in training and development activities, high level of personnel competence and skill); Productivity (efficient performance); Planning (operation planned and scheduled to avoid lost time, little time spent on minor errors); Flexibility (willingly tries out new ideas and suggestions, ready to tackle unusual problems); Cohesion (lack

of complaints and grievances, lack of conflict among cliques within the organization); Supervisory Control (supervision in control of progress of work); and Coordination (coordinate and schedules activities with other organizations, utilizes staff assistance).

Mahoney's study was much more limited than this dissertation. The main focus of his work was the study of organizational effectiveness in a general business setting. To provide contrast, his R & D model was developed separately from the general business model in order that his results could be looked at more critically. The sample he used for the R & D model involved 32 managers from 4 companies.

Nonetheless, a strong similarity exists between his R & D model and the results of the present research. Each of nine criteria - Reliability, Cooperation, Development, Productivity, Planning, Flexibility, Cohesion, Supervisory Control and Coordination - is contained in one or more of the eleven effectiveness dimensions. The present research, however, provides a much more detailed model of organizational effectiveness in R & D settings by building and expanding upon the only previous work done in this field of study.

End-Result Variables

An analysis of the end-result items provide some insight as to how organizational effectiveness is actually being measured in R & D settings. It can be seen from the results displayed in Table 10 that of the thirteen variables - Quality of output or performance; Unit's degree of goal attainment; and Amount of work done on time - have the least amount of variability as well as the highest average scores (variance scores 1,371, 1.009 and 1.51, respectively kurtosis measures of 2.725, 0.772 and 1.040, respectively). The results indicate that these variables are the most frequently as well as the most consistently used measures of organizational effectiveness in R & D settings.

This finding creates an interesting paradox: Cameron's basic reason for developing an alternative methodology for studying organizational effectiveness was that the previous techniques were not applicable to the particular type of organization he proposed to study, i.e., an organized anarchy. One of the most common characteristics of organized anarchies is that their goals are generally ill-defined, complex, changing and contradictory (Cameron, 1980) The findings of this research demonstrate that the second most popular measurement of performance for R & D organizations, e.g., an organized

anarchy, is the unit's degree of goal achievement. Perhaps, since the questionnaire does not reveal what definitions a manager would use, one could speculate that the respondents may not utilize clear or quantifiable goals.

Variables 4 to 6 - Unit's level of efficiency; Percentage of project completions; and Percentage of results adopted by the company - all have mean scores above the midpoint of the seven point answer scale. They are not as easily interpretable as variables 1-3 because of their variability. These variables need to be looked at more closely in order to determine whether an intervening variable is playing a role in their scoring.

At this point in the data analysis it is difficult to determine the relevance of variables 7 to 13. A careful analysis of intervening variables such as industry size, actual work being done, the effectiveness of the organization or unit, and the particular industry might give further insight into the meaning of each of these variables, but this is beyond the defined scope of this dissertation.

Further analysis of the data may provide answers to a few additional observations. The reported most frequently used measures are also the "softest", i.e., the most difficult to quantify. The opposite also appears true. The reported least frequently used measures are the

easiest to quantify. There also appears to be the need to relate the high ranking measures to industries and/or specific firms which are thought to be (or are) successful or "effective" by such traditional measures as profitability and introduction of technological innovations. Time limitations prohibit the inclusion of these analyses in this document, but perhaps as the next step in the research process they can be considered.

Implications and Conclusions

The central research question addressed in this dissertation concerned whether it was possible to measure organizational effectiveness in research and development facilities. The answer to this question is visible in the results presented in the previous chapter. The research data indicate that the construct of organizational effectiveness in R & D settings is composed of eleven dimensions (see Table 12). In other words, this research indicates that organizational effectiveness in R & D settings is operationally defined by eleven dimensions which contain a total of ninety-five items.

The main intent of the dissertation was to develop a descriptive model of effectiveness in these settings. An instrument has been developed for defining and measuring this phenomenon (see Appendix III). It can be the first

step in a fine-grained analysis of effectiveness on an organizational level in identifying relevant effectiveness dimensions. The instrument could now be developed into eleven separate instruments in an in-depth analysis of each of the eleven dimensions. No single profile is necessarily better than any other since many factors help determine what combination is most appropriate for an R & D unit. Once a profile of effectiveness is identified for a unit, however, a fine-grained analysis of effectiveness can then really be made.

Further work also should be done to develop linkages or causal relationships resulting in predictive models. This dissertation has focused entirely on the underlying structure and the dimension of organizational effectiveness in R & D settings. A next step in the stream of research would be to explain and predict organizational effectiveness in these settings. The basis for this work has already been developed. The items constituting the dimensions have been organized into causal and intervening categories (Appendix X); their intercorrelations have been identified (Appendix VI); and their relationships with the end-result variables have been charted (Appendix XI).

The results of this research will be useful to various groups of people. For scholars, the dissertation has demonstrated the usefulness of a novel approach to the

study of organizational effectiveness. Cameron's original work has now been successfully replicated in an entirely different organizational setting. This should encourage researchers to study organizational effectiveness as well as other abstract constructs in different types of organizational settings. Further, two data bases now exist for comparison of future results.

For professors of management it provides new knowledge for use in the classroom. The results will be very useful in MBA programs, especially those with such concentrations as engineering management, high-tech management, and research management. The results of the study represent the first comprehensive management model in the area of R & D management. They provide an outline for the design of specific courses as well as for curriculum development.

For the end-users of research, management practitioners, the dissertation results will provide a variety of uses. Almost all R & D managers begin their professional careers as technicians, e.g., scientists, researchers or engineers, and they become managers for a variety of reasons. One problem that organizations constantly face is how to develop specialized technicians into effective managers.

The results of this research contribute to the solution of this problem by providing a model of management development in R & D settings. Planning and training personnel will be able to use the research results as a basis for the evaluation of existing management development programs, or they can use the results to help in the design and development of new programs.

The dissertation results can also serve as a management assessment mechanism for people already in R & D management positions by helping to identify existing knowledge and skills deficiencies and strengths. Specific training and education needs can be identified and specifically addressed instead of providing general training.

The research results also provide important information to the top management of an organization by the development of a model of the aspects important to the life of an R & D unit. Top management decisions involving resource allocations, communications and organizational goal setting will be strengthened as a result of the knowledge developed in this research.

This dissertation has accomplished what it proposed to do: the construct of organizational effectiveness in research and development facilities has been operationally defined; an instrument for defining and measuring organizational effectiveness in R & D settings has been

developed; the discovery of the major factors that are associated with organizational effectiveness in these settings have been identified; and a descriptive model useful to managers in R & D settings has been developed.

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APPENDIX I:
ORGANIZATIONAL EFFECTIVENESS CRITERIA

Table 16: Organizational Effectiveness Criteria

1. Unit's stability.
2. Unit size.
3. Unit's degree of goal attainment.
4. Spread of abilities among individuals in the unit.
5. Employee productivity.
6. Level of efficiency in work (e.g., maximum output from resources available).
7. Degree of control over unit's environment (autonomy).
8. Top management's attention required to solve problems arising in the unit.
9. Unit can be counted on to come through under pressure (reliability).
10. Degree of unit's sense of identity.
11. Individual group preferences within unit are subordinated to company needs and goals.
12. Degree to which organizational philosophy and policies are accepted within the unit.
13. Focus on the achievement of the unit's goals.
14. Degree of concern for profitable company performance within the unit.
15. Unit profitability.
16. Unit growth.

17. Amount of "dead weight" in the unit.
18. How vacancies are filled within the unit.
19. Availability of manpower. (Human resources.)
20. Accidents in the unit.
21. Quality of in-house library facilities.
22. Degree of mechanization (e.g., output being produced by inanimate sources of energy).
23. Number of individuals not associated with the organization who serve on projects.
24. Unit's capacity to test reality.
25. Amount of push, follow-up, and checking required to ensure goal attainment.
26. Unit deviates from established policy and standard procedures.
27. Initiates improvements in work methods, operations, etc.
28. Unit's ability to cope with emergency situations.
29. Ready to tackle unusual problems outside the normal operations of the unit.
30. Change of established routines creates confusion and disruption within unit.
31. Resistance to change within the unit.
32. Degree of change of individual job duties and responsibilities within the unit.

33. Division of labor (degree to which tasks are subdivided; range of responsibilities assigned to individuals within the unit).
34. Specialized departmentalization (manner in which work is allocated and the degree to which work is interdependent).
35. Degree of equity of treatment and rewards within the unit.
36. Degree of recognition and rewards for good work.
37. Degree of authorization (sanction) for role performance.
38. Sanction systems for individualistic output.
39. Sanction systems for collectivistic (group) output.
40. Unit achievement recognition.
41. Disciplinary actions within the unit.
42. Degree of long-term planning and goal setting.
43. Emphasis on short run goals within the unit.
44. Ability to coordinate work within the unit.
45. Time spent on projects unrelated to major objectives within the unit.
46. Degree to which detailed routines are set up for all operations within the unit.
47. Decision making style within the unit (participative, individualistic, etc.).

48. Degree of delegation of decision making to subordinates within the unit.
49. Rational versus charasmatic decision making (roles vs. person).
50. Centralization with respect to strategic decision making within the unit.
51. Centralization with respect to tactical decision making within the unit.
52. Time lost and wasted through indecision within the unit.
53. The general social environment within the unit (cooperative/supportive - competitive).
54. Amount of conflict and frustration in the unit.
55. Degree of resolution of disagreements or conflicts within the unit.
56. Receptivity to new ideas within the unit.
57. Emphasis on "creativity" within the unit.
58. Results rather than procedures emphasized within the unit.
59. Production centered atmosphere within the unit.
60. People centered atmosphere within the unit.
61. General levels of trust among people within the unit.
62. Degree of conformity in attitudes, behavior and beliefs of employees within the unit.

63. Intellectual orientation (degree to which your unit has a stimulating intellectual environment with a high concern for intellectual development).
64. Individuals new to the unit are accepted by other employees.
65. Ability of the unit to acquire resources needed to be effective.
66. Number of voluntary/involuntary changes in employment within the unit.
67. Employee absenteeism within the unit.
68. Number of employees on leave within the unit.
69. When hiring new employees, the ability of the unit to attract leading people in their respective fields.
70. Drawing power for national labor market. (In relation to other R & D organizations which you directly compete for employees, how is your drawing power for the national labor market?)
71. Drawing power for local labor market.
72. Drawing power for financial resources (e.g., ability to obtain needed financial resources).
73. Number of transfer employees (e.g., those who worked in similar jobs elsewhere).
74. Degree of the unit's synergy with other departments (e.g., coordination of scheduled work).

75. Conflicts with other units resolved without appeal to higher authority.
76. Amount of feedback or information obtained from outside the unit.
77. Interdepartmental communication (e.g., transfer of knowledge to and from other units).
78. Interdepartmental relations.
79. Judgment of peer groups and/or potential beneficiary groups regarding worth/impact of projects.
80. Societal value placed on the unit's work.
81. Community service of unit's employees.
82. Emphasis on community relations within the unit.
83. Community oriented programs, workshops, projects, or activities sponsored by the unit.
84. Type of supervision style and control within the unit.
85. Management training and skills of supervisors in the unit.
86. Degree of supervisor's understanding of the jobs in his area.
87. Unit supervisor has the ear of top management.
88. Supervisors have confidence in their ability to supervise within the unit.
89. Employees respect supervisors for technical expertise.

90. Supervisory authority respected within the unit.
91. Supervisor-supervisee relations within the unit.
92. Supervisors back up their subordinates within the unit.
93. Employees stand behind and support their supervisors within the unit.
94. Amount of time supervisor spends doing bench work within the unit.
95. Supervisor awareness of how well their performance meets company standards.
96. Supervisory freedom to take action within the unit.
97. Methods and practices in the unit are consistent among supervisors.
98. Amount of internal feedback and information obtained within the unit.
99. System of communication or transmission of information within the unit (guarded-open).
100. Degree of horizontal communication within the unit.
101. Degree of vertical communication within the unit.
102. Emphasis in the unit on outside professional activities.
103. Emphasis on outside academic activities.
104. Training programs within the unit.
105. Use of talents and expertise of employees within the unit.

106. Career development opportunities within unit.
107. Employees' ability to analyze problems.
108. Employee depth of knowledge concerning facts and principles across fields of study.
109. Employees' breadth of knowledge about facts and principles across fields of study.
110. Employees' attitudes toward new and different ideas and things.
111. Employees' physical dexterity and skills.
112. Employees' technical skills.
113. Employee adaptability (e.g., when changes are made in the routines or equipment how quickly do people accept and adjust to these changes).
114. Employees' perception of their self-image.
115. Number of extra work activities for employees.
116. Employee racial attitudes and beliefs.
117. Employee political attitudes and beliefs.
118. Employee religious and spiritual activities and beliefs.
119. Employee ethical and moral attitudes and their beliefs and concern for human welfare.
120. Employee interest in and acquaintance with the arts, great books, and other cultural artifacts and activities.

121. Employees abilities to live and interact with other people within the unit.
122. "Politicking" of individuals within the unit to gain personal advantage.
123. Conflicts among cliques within the unit.
124. Employees have participated in activities that enhance their communication skills.
125. Employees' membership in social, charitable, political or civic organizations.
126. Number of awards and citations earned by employees for social contributions.
127. Level of employee academic attainment.
128. Number of employees going to school.
129. Number of employees who pass certification or licensing exams.
130. Employees working at the "cutting edge" of their field (e.g., awareness of current issues, well read, etc.).
131. Employee publications or articles in professional journals.
132. Employee attendance at professional meetings.
133. Number of employees invited to participate in professional meetings or conferences.
134. Number of papers presented at professional meetings.

135. Professional awards or honors received by employees.
136. Numbers of patents awarded and copy rights obtained by employees.
137. National reputation of employees in their respective fields.
138. Employee degree of satisfaction with knowledge and skills development (e.g., changes in breadth and depth of knowledge, changes in communication skills).
139. Employee perception of their professional growth and development as a result of their experiences at work.
140. Extent to which career goals are met.
141. Number of employees receiving career or professional counseling.
142. Number of employees who use unit as a career stepping stone.
143. Employees' abilities to apply general or specialized knowledge to a problem and implement a solution.
144. Employees' ability to anticipate problems that may come up in the future and preventing them from occurring or minimizing their efforts.
145. Employee satisfaction with entire company.

146. Employee satisfaction with unit.
147. Employee satisfaction with job.
148. Employee degree of satisfaction with social and cultural development (e.g., ability to get along with others, appreciation of cultural activities).
149. Employee degree of satisfaction with personal and non-professional development (e.g., ability to cope with new situations, changes in self-concept).
150. Manifested employee dissatisfaction.
151. Received employee complaints in regard to their work lives.
152. Employee psychological commitment to the unit.
153. Employee morale within the unit.
154. Employee preference for this organization over others.
155. Team spirit displayed or esprit de corps (e.g., at activities or events, a large showing of support generally occurs).
156. Employees get together socially outside of the workplace.
157. Amount of extra work and study by employees (e.g., reading, writing, etc.).
158. Employee current and desired social and economic level.

- 159. Number of unit's employees on policy-making or committees.
- 160. Organizational health (runs smoothly, absence of strain).
- 161. Organizational stability.
- 162. Organizational size.
- 163. Degree to which top management are fair and reasonable in their decisions which affect your work.
- 164. Degree to which top management understands your needs.
- 165. Degree of units integration with entire organization (synergy).
- 166. Organization's adaptiveness to its environment (i.e., responsiveness of organization to meeting changing needs of the external environment).
- 167. Flexibility of top management.
- 168. Community attitudes toward organization.

APPENDIX II:

INITIAL LETTER SENT TO R & D MANAGERS



Graduate School of Management

CLARK UNIVERSITY

950 Main Street
Worcester, Massachusetts 01610
617/793-7406

The purpose of this letter is to request your participation in a study of management practices in industrial research and development organizations being conducted among a large number of businesses and industries in New England. The primary purpose of the project is to assess factors accounting for differences in organizational effectiveness in R&D settings.

The study will require you to share your perceptions of organizational characteristics by participating in an interview session and responding to a follow-up questionnaire. The interview takes about two hours to complete, and the questionnaire about thirty minutes. Your responses as well as the name of your organization will remain strictly confidential.

A written feedback report will be provided to you after the data have been compiled and summarized. It is anticipated that the report will be useful to you in future organizational planning, as a diagnostic tool in pointing out strengths and weaknesses, and in comparing your own ratings with those of other R&D organizations. Whereas no organization will be identified outside the organization itself, some demographic data will be provided to make the comparisons on the effectiveness dimensions more meaningful.

I will follow this letter with a telephone call to give you a more detailed description of the project as well as to answer any questions.

Sincerely yours,

Martin R. Moser
R&D Management Project

(617) 793-7463

MRM/lj

APPENDIX III:
SURVEY INSTRUMENT

R&D MANAGEMENT STUDY

This questionnaire asks for your judgements about characteristics and operations of the R&D unit you manage. Data concerning your unit, rather than the overall organization, are being sought.

Please answer frankly and honestly. It is important that your answers accurately reflect your views and feelings. Answer every question even if you must guess - your best guess is more useful than no answer at all.

SECTION I

What industry are you in? _____

What is/are the kind(s) of work done in the unit? _____ Research _____ Development _____ Engineering

Other, please specify _____

What is/are the primary activity(ies) of the unit?

- _____ RD&E for parent organization
 _____ on contract for government
 _____ on contract for industry
 _____ consultation for others

How many people are employed in the entire unit? _____

How many of these people supervise others? _____

SECTION II

We would like you to evaluate the overall effectiveness of this R&D unit. What you personally consider in judging effectiveness may be completely individual and it is your judgement that we are seeking here.

HOW EFFECTIVE IS THIS R&D UNIT RELATIVE TO ALL OTHER UNITS YOU HAVE KNOWN WHETHER YOU SUPERVISED THEM OR NOT. Circle "7" if this is the most effective you have ever encountered and "1" if it is the least effective you have ever known. The numbers in between indicate relative positions between best and worst.

Least Effective 1 2 3 4 5 6 7 Most Effective

SECTION III - TO WHAT EXTENT ARE THE FOLLOWING CHARACTERISTICS TYPICAL OF THIS R&D UNIT? PLEASE CIRCLE THE APPROPRIATE NUMBER USING THE SCALE BELOW.

	Very true, or highly typical			Neither typical or atypical			Very untrue, or highly atypical
This R&D unit has a stimulating intellectual environment with a high concern for employee intellectual development	7	6	5	4	3	2	1
This unit has the ability to obtain the resources needed to be effective.	7	6	5	4	3	2	1
This unit deviates from established policy and standard procedures.	7	6	5	4	3	2	1
Detailed routines are set up for all operations within the unit	7	6	5	4	3	2	1
Results rather than procedures are emphasized within the unit	7	6	5	4	3	2	1
The unit coordinates its scheduled work operations with other units	7	6	5	4	3	2	1
The unit has a people-centered atmosphere	7	6	5	4	3	2	1
The unit initiates improvements in work methods and operations, etc.	7	6	5	4	3	2	1
The unit accurately perceives reality	7	6	5	4	3	2	1
Top management has an accurate perception of the unit's effectiveness	7	6	5	4	3	2	1
The process of filling vacancies in the unit is extremely effective	7	6	5	4	3	2	1
Personnel assignments within the unit are based on tenure	7	6	5	4	3	2	1
Personnel assignments within the unit are based on skill and expertise.	7	6	5	4	3	2	1
The unit receives a high degree of achievement recognition.	7	6	5	4	3	2	1
The person currently in the unit supervisor's position plays the most important role in the overall effectiveness of the unit	7	6	5	4	3	2	1

SECTION IV - TO WHAT EXTENT DOES THE UNIT EMPHASIZE OR ENCOURAGE THE FOLLOWING?
PLEASE CIRCLE THE APPROPRIATE NUMBER USING THE SCALE BELOW.

	Very high degree of emphasis or encouragement		Moderate degree of emphasis or encouragement		No emphasis or encouragement	
Outside academic activities	7	6	5	4	3	2 1
Individuals engaging in professional activities outside the company	7	6	5	4	3	2 1
Activities outside work designed specifically to enhance employees personal, non-professional development.	7	6	5	4	3	2 1
Reward or recognition systems for individual output within the unit	7	6	5	4	3	2 1
Reward or recognition systems for collective (group) output within the unit	7	6	5	4	3	2 1
Reward and recognition systems for role performance	7	6	5	4	3	2 1
Emphasis on "creativity" within the unit.	7	6	5	4	3	2 1
Focus on the achievement of the unit's goals.	7	6	5	4	3	2 1
Management training and skills of supervisors within the unit	7	6	5	4	3	2 1
Quality of the support functions within the unit.	7	6	5	4	3	2 1

SECTION V - PLEASE CIRCLE THE APPROPRIATE NUMBER USING THE SCALE BELOW.

	A very large number or amount		A moderate number or amount		None	
How many career development activities are provided for employees within the unit?	7	6	5	4	3	2 1
What is the degree of change of individual job duties and responsibilities within the unit?	7	6	5	4	3	2 1
How many individuals not associated with the unit who serve on projects (e.g., consultants)?	7	6	5	4	3	2 1
How much time is spent on projects unrelated to major objectives within the unit?	7	6	5	4	3	2 1
How many activities not related to work are engaged in by employees?	7	6	5	4	3	2 1
How much interdependence is there in the work done in the unit?	7	6	5	4	3	2 1
To what degree does the geographic location of the unit play an important part in the unit's overall effectiveness?	7	6	5	4	3	2 1

SECTION VI - PLEASE CIRCLE THE APPROPRIATE NUMBER USING THE SCALE BELOW.

	Almost all		Almost half		Almost none	
How many employees would you say have national reputations in their respective fields?	7	6	5	4	3	2 1
How many employees engage in extra work and study related to their jobs over and above what is specifically assigned?	7	6	5	4	3	2 1
How many of the unit's employees would you estimate work at the "cutting edge" of their field (e.g., regularly read current journals, discuss current issues in their field, etc.)?	7	6	5	4	3	2 1
How many employees have participated in activities that enhance their communication skills?	7	6	5	4	3	2 1
How many employees have received career counseling?	7	6	5	4	3	2 1
How many employees are going to school?	7	6	5	4	3	2 1
How many employees attend professional meetings?	7	6	5	4	3	2 1
How many employees feel satisfied with their professional growth and development as a result of their experiences at work?	7	6	5	4	3	2 1
How many employees have a positive perception of their self-image?	7	6	5	4	3	2 1
How many individuals within the unit are challenged by their work assignments?	7	6	5	4	3	2 1
How many employees are satisfied with their salary levels?	7	6	5	4	3	2 1

SECTION VII - RATE YOUR PERCEPTIONS OF THE GENERAL DAY-TO-DAY FUNCTIONING OF THE R&D UNIT.
PLEASE RESPOND BY CIRCILING THE NUMBER THAT BEST REPRESENTS YOUR PERCEPTIONS OF EACH ITEM.
IF YOU AGREE STRONGLY WITH THE ONE END OF THE SCALE, CIRCLE A NUMBER CLOSE TO THAT END.
IF YOU FEEL NEUTRAL ABOUT THE ITEM, CIRCLE A NUMBER NEAR THE MIDDLE OF THE SCALE.

FOR EXAMPLE:

*** How do you perceive the weather in this town:

Warm, bright and sunny 7 6 5 4 3 2 1 Cold, dismal and cloudy

HOW DO YOU PERCEIVE THE FOLLOWING?

Equity of treatment and rewards within the unit:

People treated fairly and rewarded equitably 7 6 5 4 3 2 1 Favoritism and inequity present, unfair treatment exists

Long-term planning and goal setting within the unit:

Much goal-directed activity, long-term planning, continuous goal assignments 7 6 5 4 3 2 1 No goal-directed activity, no planning, no goal assignments

General pattern of supervision and control within the unit:

Rigid control, strict supervisor pressure to conform 1 2 3 4 5 6 7 Respect for differences, personal freedom, individual autonomy

Resolution of disagreements or conflicts within the unit:

Imposition, avoidance, dictum, suppression; bad feelings result 1 2 3 4 5 6 7 Face-to-face, compromise democratically; positive feelings result

Conflicts and friction within the unit:

Large amount of conflict, disagreements, anxiety, friction 1 2 3 4 5 6 7 No friction or conflict, friendly, collaborative

Interdepartmental relations within the company:

Lots of coordination, joint planning, collaboration, no friction 7 6 5 4 3 2 1 No joint activity, conflict, lack of coordination and communication

Organizational health of the entire company:

Company runs smoothly, healthy organization, productive internal functioning 7 6 5 4 3 2 1 Company runs poorly, unhealthy organization, unproductive internal functioning

The flexibility of top management of the company:

Willing to change, adaptable, progressive, flexible 7 6 5 4 3 2 1 Rigid, unwilling to change, unyielding

Adequacy of resources to assist in training subordinates within the unit:

Training resources provided are very adequate 7 6 5 4 3 2 1 Training resources provided are very inadequate

Level of performance goals superiors expect unit to achieve:

Expect extremely high goals 7 6 5 4 3 2 1 Expect extremely low goals

Extent to which review and control functions are concentrated within the unit:

Review and control highly concentrated in upper levels 1 2 3 4 5 6 7 Review and control done at all levels

Extent to which superiors have confidence and trust in subordinates within the unit:

Have no confidence and trust 1 2 3 4 5 6 7 Have complete confidence and trust

Extent to which subordinates have confidence and trust in superiors within the unit:

Have no confidence and trust 1 2 3 4 5 6 7 Have complete confidence and trust

Level in the unit at which decisions are finally made:

Bulk of decisions at top	1	2	3	4	5	6	7	Decision-making done at all levels
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The manner in which goal-setting is done within the unit:

Except in emergencies, goals are usually established by means of group participation	7	6	5	4	3	2	1	Orders issued
--	---	---	---	---	---	---	---	---------------

Kinds of attitudes unit's employees develop toward company and its goals:

Attitudes are strongly favorable and provide powerful stimulation to behavior conducive to the achievement of company's goals	7	6	5	4	3	2	1	Attitudes are hostile and counter to organization's goals
---	---	---	---	---	---	---	---	---

Employee satisfaction derived from working in the unit:

Relatively high satisfaction with membership in the unit, with supervision and with one's own achievements	7	6	5	4	3	2	1	Usually dissatisfaction with membership in the unit, with supervision and with one's own achievements
--	---	---	---	---	---	---	---	---

Direction of information flow within the unit:

Downward only	1	2	3	4	5	6	7	Down, up and with peers
---------------	---	---	---	---	---	---	---	-------------------------

Within the unit, extent to which superiors willingly share information with subordinates:

Provide minimum of information	1	2	3	4	5	6	7	Seek to give subordinates all relevant information and all information they want
--------------------------------	---	---	---	---	---	---	---	--

Extent to which communications are accepted by subordinates within the unit:

Generally accepted, but if not, openly and candidly questioned	7	6	5	4	3	2	1	Viewed with great suspicion
--	---	---	---	---	---	---	---	-----------------------------

Adequacy of upward communication within the unit:

Very little	1	2	3	4	5	6	7	A great deal
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Level of responsibility subordinates feel for initiating upward communication within the unit:

None at all	1	2	3	4	5	6	7	Considerable responsibility felt, much initiative
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Accuracy of upward communication within the unit:

Accurate	7	6	5	4	3	2	1	Inaccurate
----------	---	---	---	---	---	---	---	------------

Sideward or horizontal communication within the unit, its adequacy and accuracy:

Usually poor	1	2	3	4	5	6	7	Good to excellent
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Amount of interaction within the unit aimed at achieving the company's objectives:

Very little	1	2	3	4	5	6	7	Much with both individuals and groups
-------------	---	---	---	---	---	---	---	---------------------------------------

Amount of cooperative teamwork present within the unit:

Very substantial throughout	7	6	5	4	3	2	1	None
-----------------------------	---	---	---	---	---	---	---	------

Extent to which employees are involved in decisions related to their work within the unit:

None at all	1	2	3	4	5	6	7	Involved fully in all decisions related to their work
-------------	---	---	---	---	---	---	---	---

Employees' attitudes towards other members of the unit:

Favorable, cooperative attitudes throughout the unit with mutual trust and confidence	7	6	5	4	3	2	1	Subservient attitudes toward superiors coupled with hostility; hostility toward peers and contempt for subordinates, distrust widespread
---	---	---	---	---	---	---	---	--

Level of consistency of methods and practices among supervisors in the unit:

Very consistent 1 2 3 4 5 6 7 Very inconsistent

Degree of conformity in attitudes, behavior and beliefs of employees within the unit:

Not at all 1 2 3 4 5 6 7 Very much

Level of supervisor confidence in their ability to supervise within the unit:

Very little 1 2 3 4 5 6 7 Very much

Within the unit, level of supervisor awareness of how well their performance meets company standards:

Very little 1 2 3 4 5 6 7 Very much

Frequency of push, follow-up and checking required to ensure goals are met within the unit:

Rarely 1 2 3 4 5 6 7 Usually

Degree to which unit supervisor "has the ear" of top management:

Very much 7 6 5 4 3 2 1 Very little

Spread of abilities among individuals within the unit:

Narrow 1 2 3 4 5 6 7 Wide

Level of resistance to change within the unit:

Much 7 6 5 4 3 2 1 Little

Degree of readiness to tackle unusual problems outside the normal operations of the unit:

Very reluctant 1 2 3 4 5 6 7 Very eager

Degree to which unit can be "counted on" to come through under pressure:

Very much 7 6 5 4 3 2 1 Very little

Amount of time lost and wasted through indecision within the unit:

Very much 7 6 5 4 3 2 1 Very little

Amount of time and effort wasted because of poor internal coordination within the unit:

Very little 1 2 3 4 5 6 7 Very much

Amount of "dead weight" in the unit:

Very much 7 6 5 4 3 2 1 Very little

Amount of supervisory freedom to take action within the unit:

Very much 7 6 5 4 3 2 1 Very little

Range of responsibilities assigned to individual positions within the unit:

Very narrow 1 2 3 4 5 6 7 Very wide

Levels of competence and skill of individuals within the unit:

Very high 7 6 5 4 3 2 1 Very low

Degree of unit's sense of identity:

High degree 7 6 5 4 3 2 1 Low degree

Degree of unit stability:

Very stable 7 6 5 4 3 2 1 Very unstable

Degree to which employees understand the unit's goals and objectives:

Completely 7 6 5 4 3 2 1 Not at all

Degree of employee psychological commitment to the unit:

Very high 7 6 5 4 3 2 1 Very low

Level of employee comfort in the physical work environment within the unit:

Very much 7 6 5 4 3 2 1 Very little

Degree to which employees feel that they are effectively contributing to the work of the unit:

Very much 7 6 5 4 3 2 1 Very little

Extent to which employees career goals are met within the unit:

Not at all 1 2 3 4 5 6 7 Completely

Degree to which top management understands the unit's needs:

Completely 7 6 5 4 3 2 1 Not at all

Degree of unit's integration with entire company:

Very much 7 6 5 4 3 2 1 Very little

Unit's degree of control over its environment:

Completely 7 6 5 4 3 2 1 None at all

The degree of unit supervisor's understanding of the jobs in their areas:

A great deal 7 6 5 4 3 2 1 Very little

Level of effectiveness of interdepartmental communications:

Usually poor 1 2 3 4 5 6 7 Good to excellent

Degree of mechanization within the unit (e.g., output being produced by inanimate sources of energy):

Very high 7 6 5 4 3 2 1 Almost none at all

SECTION VIII - PLEASE CIRCLE THE APPROPRIATE NUMBER USING THE SCALE BELOW.

HOW OFTEN ARE THE FOLLOWING USED TO JUDGE THE EFFECTIVENESS OF THE UNIT?

	Always							Never						
Unit profitability.	7	6	5	4	3	2	1	7	6	5	4	3	2	1
Level of efficiency in work (e.g., maximum output from resources available)	7	6	5	4	3	2	1	7	6	5	4	3	2	1
Unit's degree of goal attainment.	7	6	5	4	3	2	1	7	6	5	4	3	2	1
Percentage of project approvals	7	6	5	4	3	2	1	7	6	5	4	3	2	1
Frequency of cost overruns.	7	6	5	4	3	2	1	7	6	5	4	3	2	1
Amount of work that gets done on time	7	6	5	4	3	2	1	7	6	5	4	3	2	1
Percentage of results adopted by the company.	7	6	5	4	3	2	1	7	6	5	4	3	2	1
Percentage of project completions	7	6	5	4	3	2	1	7	6	5	4	3	2	1
Number of technical reports produced.	7	6	5	4	3	2	1	7	6	5	4	3	2	1
Quality of output or performance.	7	6	5	4	3	2	1	7	6	5	4	3	2	1
Number of papers presented at professional meetings	7	6	5	4	3	2	1	7	6	5	4	3	2	1
Number of professional rewards or honors received by employees.	7	6	5	4	3	2	1	7	6	5	4	3	2	1
Number of patents awarded or copyrights obtained by employees	7	6	5	4	3	2	1	7	6	5	4	3	2	1
Other(s), please specify _____	7	6	5	4	3	2	1	7	6	5	4	3	2	1
_____	7	6	5	4	3	2	1	7	6	5	4	3	2	1
_____	7	6	5	4	3	2	1	7	6	5	4	3	2	1

SECTION IX

We would like you to once again evaluate the overall effectiveness of your R&D unit.

HOW EFFECTIVE IS THIS R&D UNIT RELATIVE TO ALL OTHER UNITS YOU HAVE KNOWN WHETHER YOU SUPERVISED THEM OR NOT?

Most Effective 7 6 5 4 3 2 1 Least Effective

SECTION X - HERE WE ASK FOR GENERAL DESCRIPTIVE INFORMATION. IF YOU DO NOT KNOW THE PRECISE ANSWERS, PLEASE ESTIMATE AS ACCURATELY AS POSSIBLE WITHOUT LOOKING UP THE INFORMATION.

Your job title _____

Your age _____ Male _____ Female _____

Your education:

_____ high school or less, _____ some college, _____ bachelor's degree, _____ masters degree, _____ doctorate

How long have you been in your present position (years)? _____

How long have you been with the company (years)? _____

Were you promoted to this position from another position within the unit? _____ No _____ Yes

Do you have any formal training in management? _____ No _____ Yes, please specify _____

What percentage of the employees are female?

_____ 0% _____ 1-20% _____ 21-40% _____ 41-60% _____ 61-80%

What percentage of employees fall into each age category?

_____ 25 or younger _____ 26-35 _____ 36-45 _____ 46-55 _____ 55 or older

What was the largest number of employees, including supervisors, who worked in the unit at any one time last year? _____

What was the smallest number of employees, including supervisors, who worked in the unit at any one time last year? _____

How many levels of supervision, including the head of the unit, are in this unit? _____

How many people report directly to the head of the unit? _____

Percentage breakdown of employee education levels:

_____ high school or less, _____ some college, _____ bachelor's degree, _____ masters degree, _____ doctorate

Which one of the following sources supplied most of the employees who are newly assigned to the unit?

- ☐ other units
☐ recruited from school
☐ other companies
☐ "at the gate"
☐ other, specify _____

During the past year, approximately how many people

- ☐ were transferred out of the unit
☐ were promoted out of the unit
☐ were discharged
☐ quit

How has the total number of employees (including supervisors) in this unit changed in the past five years?

- ☐ increased - how many _____
☐ decreased - how many _____
☐ remained the same

How has the total number of supervisors and managers in the unit changed in the past five years?

- ☐ increased - how many _____
☐ decreased - how many _____
☐ remained the same

How is the unit organized (structure)?

- ☐ matrix
☐ by functions or departments
☐ combination of matrix and function
☐ other, please specify _____

How is the entire company organized?

- ☐ matrix
☐ by functions or departments
☐ combination of matrix and function
☐ other, please specify _____

How many employees in total are there in the entire company? _____

What is the company's total sales in dollars? _____

How old is the company (in years)? _____

Profitability of company last year compared to industry standards.

Very Profitable 7 6 5 4 3 2 1 Very Unprofitable

Please list the professional organizations to which you belong.

Please list professional publications you read on a regular basis.

What is/are your most important source(s) of information in regard to the management aspects of your job?
 (Rank order the following with 1 being the most important)

- ☐ reading
☐ talking
☐ experience
☐ training
☐ other, specify _____

Thank you very much for your cooperation.

IF YOU WOULD LIKE A REPORT OF THE RESULTS OF THIS STUDY, SEND A SHORT NOTE OR PUT YOUR NAME AND ADDRESS ON THE RETURN ENVELOPE.

APPENDIX IV:

COVER LETTER ENCLOSED WITH QUESTIONNAIRE



Graduate School of Management

CLARK UNIVERSITY

850 Main Street
Worcester, Massachusetts 01610
617 / 93 / 406

July 27, 1982

Dear :

In an attempt to improve organizational effectiveness in industrial research and development departments, we are studying differences in management practices. We write to request your participation in this project.

The enclosed questionnaire has been designed so that you can easily share your perceptions of the organizational characteristics of your unit. The questionnaire can be completed in fewer than thirty minutes, and your responses will be kept completely confidential.

Should you wish to receive a copy of our survey results-- which may be useful to you as a diagnostic tool in assessing strengths and weaknesses as part of your organizational planning--please simply put your name on the return envelope or send me a short note.

On behalf of the research team, I hope you find our questions interesting and thought provoking. Should you have any questions, comments, or suggestions, please feel free to write or telephone. Your completed questionnaire should be returned in the stamped envelope provided as soon as possible. Thank you, in advance, for your time and assistance.

Sincerely yours,

Martin R. Moser
R&D Management Project

Enclosures

P.S. Time management experts say to handle a piece of paper only once, so if possible, please do the questionnaire now!

APPENDIX V:
FOLLOW-UP POSTAL CARD

August 11, 1982

Studies show that many questionnaires never reach their destinations. We sent one to you on July 27. If you have already returned it, ignore this card. If you haven't, your response is very important to the life of this project. If you never received it, please let me know.

Martin R. Moser
Research and Development Management Project
Graduate School of Management
Clark University
950 Main Street
Worcester, MA 01610
(617) 793-7406

APPENDIX VI:

INTERCORRELATION MATRIX OF QUESTIONNAIRE ITEMS

Table 17: Intercorrelation Matrix of Questionnaire Items

Dimension I: Organizational Synergy

*	6	10	14	25	45	49	50	51	53	59	77	95	96
6	1.000	.1986	.0380	.1038	.0645	.2148	.2283	.1528	.1248	.0340	.1362	.1767	.2588
10	.1986	1.000	.5717	.3215	.1741	.3942	.5652	.4815	.3571	.4540	.5090	.7006	.4866
14	.0380	.5717	1.000	.1976	.2216	.3344	.3973	.3584	.3399	.4050	.5313	.5136	.3604
25	.1308	.3215	.1976	1.000	.2596	.2843	.3430	.3380	.3269	.3083	.2228	.3653	.2591
45	.0645	.1741	.2216	.2596	1.000	.2208	.2567	.2740	.2434	.2281	.3041	.2936	.3205
49	.2148	.3942	.3344	.2843	.2208	1.000	.4659	.4062	.4508	.3810	.3827	.4612	.4845
50	.2283	.5652	.3973	.3430	.2567	.4659	1.000	.6691	.4644	.4551	.3891	.6162	.5139
51	.1528	.4815	.3584	.3380	.2740	.4062	.6691	1.000	.4628	.4485	.4266	.6191	.5031
53	.1248	.3571	.3399	.3269	.2434	.4508	.4644	.4628	1.000	.3588	.3581	.4743	.3098
59	.0340	.4540	.4050	.2083	.2281	.3810	.4551	.4485	.3588	1.000	.3658	.5384	.4202
77	.1362	.5090	.5313	.2228	.3041	.3827	.3891	.4266	.3581	.3658	1.000	.5905	.4339
95	.1767	.7006	.5136	.3653	.2936	.4612	.6162	.6191	.4743	.5384	.5905	1.000	.4853
96	.2588	.4866	.3604	.2591	.3205	.4845	.5139	.5031	.3098	.4202	.4339	.4853	1.000
99	.2847	.2721	.3059	.3914	.3198	.4845	.3804	.3532	.3651	.2322	.3663	.3382	.4208

*	99	2	11	40	43	60	88	89	90	91	92	93	94
6	.2847	.0969	.0711	-.0195	.1011	.1137	-.0152	.0221	.1268	.0924	-.0028	.1079	-.0156
10	.2721	.4085	.4730	.2917	.2360	.4181	.3468	.3654	.4986	.3472	.1208	.3989	.3296
14	.3059	.5294	.4478	.2296	.1350	.4238	.4974	.3766	.3540	.3189	.1107	.3985	.2835
25	.3914	.3042	.3741	.3856	.1828	.3334	.2976	.3508	.3810	.3187	.0914	.2789	.2635
45	.3198	.1595	.1598	.2602	.1096	.3429	.1464	.2537	.2593	.3182	.1118	.2462	.1881
49	.4845	.2403	.2057	.3184	.0897	.3047	.2080	.2789	.4086	.1569	.1025	.2853	.2280
50	.3804	.3871	.3865	.3742	.3180	.3850	.3093	.3687	.4477	.2793	.1064	.2960	.3483
51	.3532	.3760	.3144	.2767	.2523	.3491	.2678	.2290	.2882	.1877	.0807	.1640	.1880
53	.3651	.2459	.2378	.1961	.0307	.1822	.2823	.1596	.2017	.1200	.1173	.1737	.0945
59	.2322	.2900	.3298	.4862	.3151	.5891	.3624	.3362	.4600	.4000	.2275	.3693	.2465
77	.3663	.3247	.2046	.2569	.0992	.3120	.3166	.2327	.3699	.2331	.0566	.3818	.1650
95	.3382	.4443	.4125	.3922	.1991	.4824	.2823	.2966	.4862	.3811	.1282	.3919	.3055
96	.4208	.3955	.2465	.2957	.2424	.4482	.3565	.3479	.4583	.3172	.0432	.4092	.2699
99	1.000	.2280	.1536	.2569	.1728	.2054	.2542	.2087	.3326	.2482	-.0454	.2738	.2102

*	97	98	44	54	55	56	57	61	62	63	64	65	66
6	-.0581	.0326	.1103	.0885	.0015	-.0192	-.0405	-.0422	.0081	.1163	.0917	.0113	.0335
10	.3481	.2492	.3393	.2243	.3232	.2778	.3068	.2233	.0333	.3019	.2264	.0767	.1570
14	.3708	.2012	.2457	.2215	.3730	.2220	.2983	.2146	.0583	.1709	.1910	.0920	.2783
25	.2309	.2270	.2734	.2401	.2739	.2916	.1700	.3041	.0905	.3045	.1752	.2221	.2549
45	.2449	.1710	.2614	.2985	.2213	.2553	.0804	.1036	.1772	.1064	.1197	.1895	.1302
49	.1448	.1554	.2512	.2643	.3668	.2015	.1135	.1570	.1907	.2116	.1746	-.0117	.2345
50	.2572	.1592	.2588	.2682	.2932	.1461	.1881	.1897	.0898	.2275	.1193	-.0102	.0536
51	.3103	.0632	.1890	.1244	.2423	.1475	.1296	.2602	.0899	.2189	.2404	.2629	.0355
53	.1504	.0143	.1410	.2637	.3442	.1326	.1514	.2331	.0276	.1241	.1132	.0872	.1272
59	.3805	.2813	.4352	.3175	.3966	.2838	.2623	.1538	.2241	.1770	.2565	.1626	.1024
77	.3222	.3338	.3616	.2963	.3321	.3560	.2026	.2930	.1857	.2999	.2787	.2127	.1311
95	.4280	.3056	.4284	.1700	.4044	.3195	.2305	.2863	.1629	.3102	.3206	.2180	.1904
96	.3139	.2369	.3037	.2967	.2828	.3066	.2350	.2247	.1419	.3313	.2453	.2120	.1615
99	.1415	.3148	.3273	.2543	.3092	.2411	.2230	.2354	.3301	.4329	.1725	.1455	.1159

*	67	69	70	71	74	75	86	18	21	24	26	36	37
6	.1355	.1846	-.0227	.1364	.0411	.0522	.0605	-.0511	.0623	.1793	.0314	.0520	.0124
10	.2932	.2581	.2660	.1535	.2218	.2281	.3600	.0865	.2398	.2519	.2734	.0911	-.1037
14	.3537	.3036	.2572	.1836	.0819	.2265	.4090	.1583	.3901	.1910	.2668	.1607	-.0172
25	.0673	.2782	.2538	.2034	.3982	.3682	.2233	.2056	.2366	.3822	.4070	.1187	.1202
45	.0752	.2215	.2753	.1965	.0913	.3188	.1419	-.0137	.1624	.1552	.1598	.1010	.2030
49	.3079	.2421	.1374	.1414	.2359	.3605	.1401	.0671	.2277	.1105	.2162	.0518	-.1376
50	.1238	.1905	.2158	.2252	.1074	.1814	.1219	.1310	.3162	.1993	.3133	.2816	.0633
51	.2208	.2552	.2313	.1088	.1219	.1772	.1827	.0461	.3021	.1123	.3144	.3068	.0564
53	.2810	.3149	.2280	.1525	.1766	.3275	.1353	.1308	.3362	.2013	.2380	.2965	.1144
59	.1778	.4365	.3725	.1947	.2173	.2735	.2812	.1155	.2717	.2705	.2898	.2036	.0823
77	.3527	.3532	.4673	.2119	.1502	.4391	.3618	.1100	.3418	.1537	.1870	.2169	.0173
95	.2915	.3609	.3750	.1956	.2520	.3161	.2879	.1379	.3013	.2654	.2112	.1996	.0089
96	.1488	.3756	.2966	.3674	.0852	.2033	.2542	.1639	.2338	.3639	.3005	.2324	.1234
99	.3294	.3193	.3051	.2680	.1723	.3713	.2142	.0960	.3282	.2651	.2194	.1424	.0855

*	52	58	72	79	81	82	83	84	16	17	28	33	34
6	.0532	.2241	-.1611	.0128	.1180	-.0826	-.1860	-.1000	-.0852	-.1741	-.0487	-.2223	-.1368
10	.2512	.2374	-.1745	-.1767	.1638	-.2620	-.2875	-.3644	.2000	.1143	.1689	.1348	.2968
14	.2710	.2620	-.2565	-.1615	.2904	-.1536	-.2180	-.2290	.2338	.1938	.0487	.2591	.2236
25	.2656	.1439	-.2776	-.1846	.3024	-.3134	-.3830	-.3336	-.0048	.0782	.0680	.0117	.1472
45	.2647	.1851	-.0799	-.1377	.0760	-.1878	-.2980	-.1562	.0335	.0519	-.0589	-.0301	.0221
49	.0660	.1561	-.3291	-.1906	.0489	-.3041	-.3021	-.1580	.1058	.0658	.0574	.0879	.1350
50	.3870	.2462	-.0871	-.0811	.0646	-.1838	-.2057	-.2809	.0862	.0467	.1739	.1690	.2502
51	.3699	.2525	-.1202	-.1555	.0725	-.0757	-.0592	-.1193	.0877	.0936	.1620	.1969	.1843
53	.3385	.2557	-.1614	-.1827	.1515	-.1724	-.2738	-.3081	.0196	-.0036	.0858	.1920	.1601
59	.1517	.2566	-.1592	-.1190	.2377	-.2475	-.2290	-.3123	.1422	.1371	.1587	.2215	.3599
77	.1662	.2760	-.1844	-.1931	.2465	-.2180	-.2917	-.2490	.2144	.2690	.0214	.2199	.3124
95	.2815	.1661	-.1766	-.1619	.1949	-.2049	-.2193	-.3586	.2346	.1594	.0921	.1301	.3204
96	.3684	.4394	-.2275	-.2406	.2226	-.2621	-.3527	-.2303	.0273	.1093	.1262	.0593	.0957
99	.2524	.3001	-.3721	-.2528	.1965	-.2852	-.4387	-.2647	-.1232	.0476	.0054	.0503	-.0004

*	35	38	39	1	3	4	5	22	46	80	85	87	7
6	-.1664	-.1111	-.1796	-.1134	-.1242	.1481	.0895	-.0819	-.0837	-.1246	.0136	.0135	.2345
10	.1084	-.0653	.0093	.3415	.0431	.0286	.3818	.3726	.2357	.0157	.2843	.4043	.2217
14	.2099	.1189	.1528	.4385	.2023	-.0299	.3245	.4928	.2636	.2280	.3799	.4300	.2930
25	.0618	.1283	.1813	.1447	-.1496	.1778	.2621	.3145	.0121	.1011	.3578	.2520	.2359
45	.0918	-.0684	.1064	.1822	-.0216	.1438	.1127	.1509	.1016	.1097	.2384	.2593	.0066
49	-.0033	-.0569	.1402	.0167	-.0855	.0127	.1587	.2741	.0434	.1324	.2762	.1801	.1256
50	.1416	.0247	.1413	.1672	-.0783	.1238	.3126	.2746	.1125	-.0402	.2510	.3497	.1954
51	.1644	.0721	.2237	.1041	-.0846	.1357	.2157	.2758	.0350	-.0158	.2550	.2155	.1517
53	.1690	-.0374	.1465	.1660	-.1264	.0362	.4014	.2865	.0392	.0565	.2067	.3409	.0894
59	.2160	.0946	.1594	.1686	-.0011	.0800	.2614	.3790	.2275	.1840	.3856	.2107	.2646
77	.2278	.0282	.1757	.3841	.0905	-.0074	.3115	.3120	.1289	.2421	.4105	.3263	.1662
95	.1808	.1209	.1598	.3183	.0339	.0967	.4137	.3281	.1875	.0846	.3612	.3716	.3001
96	.0270	-.0244	.1744	.1989	.0914	.0419	.1466	.3076	.1924	.1090	.3222	.1916	.1490
99	.0698	-.0571	.1218	.0884	-.0367	.1366	.1668	.2471	-.0192	.1630	.2757	.3249	.0726

*	8	9	15	47	48	12	13	23	27	31	41	42	68
6	.0691	.2129	.0908	.0744	.0782	-.0694	.0513	.3626	.0602	.2448	.1727	.0377	.1525
10	.1605	.3892	.2053	.0548	.0631	-.0748	.3461	.3392	.2079	.2295	.1880	.2578	.3126
14	.2224	.2485	.1429	.1556	.0452	.0172	.2726	.2120	.2161	.0913	.0786	.1920	.3029
25	.2774	.4156	.1139	.2807	.1157	-.0894	.3651	.3783	.1019	.2654	.2531	.2580	.3960
45	.1463	.2300	.0833	.2134	.0270	-.0945	.1420	.3497	-.0110	.1146	.0051	.1938	.3119
49	.1235	.2742	.0297	.1671	.2052	-.1008	.2005	.1627	.1363	.1334	.1020	.3071	.3833
50	.2766	.3769	.1331	.1007	.0523	-.0229	.2488	.3506	.2306	.1040	.0642	.2842	.3920
51	.1264	.2242	.1508	.0380	-.0319	-.0188	.2334	.2295	.2603	.1641	.0715	.3137	.3526
53	.0798	.1742	.0494	.1870	.0449	.0032	.2175	.4140	.2159	.1580	.0928	.2631	.3848
59	.2790	.3334	.1413	.2633	.1349	-.0741	.3531	.3557	.2603	.3135	.1740	.3809	.4525
77	.2074	.2577	.2095	.1417	-.0064	-.1598	.2222	.2902	.2238	.1640	.1554	.4173	.3633
95	.2243	.3550	.1713	.2066	.0789	-.0453	.3857	.3528	.1927	.1812	.2436	.3757	.4119
96	.1926	.3449	.1748	.1704	.0296	-.1320	.2133	.3137	.2316	.0941	.1385	.3465	.4480
99	.1315	.3688	-.0055	.3146	.1484	-.1258	.3975	.3698	.0998	.1919	.1076	.3831	.3346

*	29	30	19	20	32	73	76	78	100
6	-.0094	-.0005	.0695	.0110	-.0620	.0338	-.0080	-.0511	.0278
10	.0876	.0534	.4246	.2535	.0982	.0975	.0435	-.1098	.0450
14	.0270	.1545	.4998	.4931	.0418	-.0334	-.0479	-.0089	.0736
25	.0468	-.0017	.2608	.2095	.0491	.1275	-.0720	-.0107	.1871
45	-.0174	-.0677	.2109	.2763	.0033	-.0306	.0400	.0512	.1345
49	.0528	.1143	.2394	.2217	.1581	.0528	.1127	-.1406	.1180
50	.0833	.1660	.3619	.2943	.1692	.0946	.1295	-.0927	.0146
51	.2725	.2259	.2522	.2866	.1727	.0914	.1545	-.0738	.0805
53	.0200	.0907	.2772	.2320	.1806	.0217	.1682	.0129	.0173
59	-.0107	.1284	.2921	.2570	.1985	.0838	.0089	-.0157	.1588
77	.0561	.1750	.4032	.4115	.0899	.0258	.1007	.0953	.1298
95	.0898	.1290	.4215	.3801	.0707	.0147	.1322	-.1190	.1394
96	.0312	.0246	.2796	.2689	.1857	.0930	.0370	-.1534	.0925
99	-.1411	-.1756	.2928	.3283	-.0887	.0482	-.1104	-.0800	.2010

Dimension 2: Unit Health

*	6	10	14	25	45	49	50	51	53	59	77	95	96
2	.0969	.4085	.5294	.3042	.1595	.2403	.3871	.3760	.2459	.2900	.3247	.4443	.3955
11	.0711	.4730	.4478	.3741	.1598	.2057	.3865	.3144	.2378	.3298	.2046	.4125	.2465
40	.0195	.2917	.2296	.3856	.2602	.3184	.3742	.2767	.1961	.4862	.2569	.3922	.2957
43	.1011	.2360	.1350	.1828	.1096	.0897	.3180	.2523	.0307	.3151	.0992	.1991	.2424
60	.1137	.4181	.4238	.3334	.3429	.3047	.3850	.3491	.1822	.5891	.3120	.4824	.4482
88	.0152	.3468	.4974	.2976	.1464	.2080	.3093	.2678	.2823	.3624	.3166	.2823	.3565
89	.0221	.3654	.3766	.3508	.2537	.2789	.3687	.2290	.1596	.3362	.2327	.2966	.3479
90	.1268	.4986	.3540	.3810	.2593	.4086	.4477	.2882	.2017	.4600	.3699	.4862	.4583
91	.0924	.3472	.3189	.3187	.3182	.1569	.2793	.1877	.1200	.4000	.2331	.3811	.3172
92	.0028	.1208	.1107	.0914	.1118	.1025	.1064	.0807	.1173	.2275	.0566	.1282	.0432
93	.1079	.3989	.3985	.2789	.2462	.2853	.2960	.1640	.1737	.3693	.3818	.3919	.4092
94	.0156	.3296	.2835	.2635	.1881	.2280	.3483	.1880	.0945	.2465	.1650	.3055	.2699
97	.0581	.3481	.3708	.2309	.2449	.1448	.2572	.3103	.1504	.3805	.3222	.4280	.3139
98	.0326	.2492	.2012	.2270	.1710	.1554	.1592	.0143	.0143	.2813	.3338	.3056	.2369

*	99	2	11	40	43	60	88	89	90	91	92	93	94
2	.2280	1.000	.4011	.2444	.2086	.4081	.3323	.4433	.2996	.2759	.1272	.3591	.2879
11	.1536	.4011	1.000	.3285	.2315	.4248	.3919	.3652	.3105	.3367	.2317	.4092	.2215
40	.2569	.2444	.3285	1.000	.4722	.5843	2941	.3694	.4272	.3291	.2507	.3413	.3478
43	.1728	.2086	.2315	.4722	1.000	.3042	.1021	.1904	.2044	.2929	.1527	.2778	.2091
60	.2054	.4081	.4248	.5843	.3042	1.000	.5127	.4695	.5620	.5802	.2854	.5197	.4009
88	.2542	.3323	.3919	.2941	.1021	.5127	1.000	.4952	.4756	.5363	.2957	.5579	.3114
89	.20887	.4433	.3652	.3694	.1904	.4695	.4952	1.000	.5251	.4775	.1835	.4173	.4460
90	.3326	.2996	.3105	.4272	.2044	.5620	.4756	.5251	1.000	.5227	.2477	.5299	.4652
91	.2482	.2759	.3367	.3291	.2929	.5802	.5363	.4775	.5227	1.000	.3149	.5656	.3716
92	-.0454	.1272	.2317	.2507	.1527	.2854	.2957	.1835	.2477	.3149	1.000	.3361	.1256
93	.2738	.3591	.4092	.3413	.2778	.5197	.5579	.4173	.5299	.5656	.3361	1.000	.4114
94	.2102	.2879	.2215	.3478	.2091	.4009	.3114	.4460	.4652	.3716	.1256	.4114	1.000
97	.1415	.3398	.3615	.2724	.2949	.3922	.2525	.3662	.3370	.3582	.3833	.3168	.3315
98	.3148	.2378	.1148	.3904	.3457	.3526	.1651	.3297	.3077	.4075	.2073	.4661	.3196

*	97	98	44	54	55	56	57	61	62	63	64	65	66
2	.3398	.2378	.2614	.1486	.4140	.2323	.1594	.1915	.1467	.1612	.1115	.0530	.0948
11	.3615	.1148	.2181	.1375	.2766	.1596	.2120	.1397	.0366	.0322	.1604	.1929	.2220
40	.2724	.3904	.4436	.2295	.3703	.3789	.3058	.2736	.3395	.2695	.3258	.1928	.1267
43	.2949	.3457	.2549	.1110	.2560	.1887	.1199	.0263	.0958	.1399	.0211	.0000	.0475
60	.3922	.3526	.5088	.3138	.4620	.5094	.3339	.3589	.3051	.3994	.4582	.3300	.2383
88	.2525	.1651	.2470	.2981	.3129	.2788	.2464	.1809	.1131	.2166	.2510	.1621	.1542
89	.3662	.3297	.3327	.3026	.2690	.4338	.3051	.2140	.1687	.2715	.1398	.0793	.1875
90	.3370	.3077	.4353	.2924	.3045	.4319	.2649	.2670	.2400	.4573	.4209	.2365	.3317
91	.2582	.4075	.4718	.2009	.3074	.4563	.2198	.1449	.1540	.3625	.2544	.1877	.1622
92	.3833	.2073	.2575	.0468	.1937	.2894	-.0274	.0434	.1172	.1160	.2796	.1704	.3079
93	.3168	.4661	.4339	.2581	.5000	.5030	.2266	.1704	.2699	.3559	.2677	.1575	.3271
94	.3315	.3196	.2419	.1610	.3140	.3192	.1140	.1120	.1320	.2267	.1316	.0530	.1295
97	1.000	.3220	.3351	.2268	.3301	.3043	.2692	.1687	.1048	.1420	.1678	.1877	.1813
98	.3200	1.000	.4324	.1665	.5022	.4763	.2191	.3312	.3364	.2609	.2609	.1274	.0667

*	67	69	70	71	74	75	86	18	21	24	26	36	37
2	.1306	.1911	.1271	.0514	.0949	.1262	.2121	.0976	.2062	.2768	.2377	.1387	.0235
11	.0305	.2211	.1453	.1569	.1973	.1680	.1356	.1413	.2178	.1901	.3325	.1843	-.0245
40	.1580	.4100	.4180	.3452	.2073	.2943	.2082	.0895	.2364	.2299	.2900	.2099	.0531
43	.0488	.2278	.2315	.1197	.0694	.1588	.0785	-.0236	.2595	.2272	.2858	.2073	.1394
60	.2989	.6036	.4060	.4282	.2840	.3232	.3276	.1154	.2301	.2161	.2858	.1685	-.0023
88	.2237	.3694	.2726	.3338	.1911	.2024	.3445	.1326	.3184	.2345	.3358	.2404	.0678
89	.1269	.2892	.1973	.3184	.2449	.2476	.1929	.0777	.2021	.2439	.3010	.1841	.0517
90	.2465	.3258	.3960	.3743	.1951	.3775	.2926	.0786	.2193	.2711	.3037	.0762	.0140
91	.1692	.3819	.3287	.3578	.3314	.4370	.2492	.1467	.2264	.2975	.3206	.2242	.0907
92	.1446	.1820	.1377	.2012	.0577	.1981	.2071	-.1359	-.0410	.0576	.0177	-.0464	-.0894
93	.2135	.3723	.3932	.2473	.2964	.4374	.3575	.0281	.1889	.2434	.1621	.0812	-.0625
94	.1738	.2491	.2695	.1973	.2654	.2829	.3079	.0438	.1661	.1370	.1520	.0360	-.0593
97	.2267	.3884	.3195	.1577	.1605	.2414	.2732	.0644	.2291	.2386	.1620	.1631	.0241
98	.1871	.3659	.4426	.1803	.2884	.3511	.3038	-.0537	.0626	.1754	.0940	.0350	-.0985

*	52	58	72	79	81	82	83	84	16	17	28	33	34
2	.3110	.1815	-.1800	-.1033	.1328	-.1962	-.1714	-.0377	.0169	.0893	-.0273	-.0067	.0846
11	.2143	.2485	-.1218	-.1219	.2123	-.1424	-.2778	-.2218	.1272	.1366	.1699	.1303	.2374
40	.1628	.1693	-.1661	-.2029	.2550	-.2680	-.3089	-.2991	.0786	.1791	.0805	.1719	.3225
43	.1806	.0722	-.1781	-.1988	.1706	-.1998	-.2202	-.2151	.0055	.0063	.0879	.1485	.1303
60	.1660	.3206	-.2408	-.2454	.3291	-.3325	-.3198	-.2954	.1629	.1314	.0414	.1148	.2566
88	.2942	.3281	-.1351	-.1934	.3193	-.2812	-.3287	-.1872	.0295	.1924	.0710	.1330	.2571
89	.2625	.2510	-.1690	-.1731	.1743	-.3509	-.3199	-.1682	-.0093	.0013	-.0207	.0473	.0921
90	.2448	.3194	-.1626	-.1709	.3091	-.4245	-.3673	-.4217	.2307	.0756	.0977	.0601	.2413
91	.1209	.2414	-.1462	-.0654	.3120	-.3472	-.3946	-.3102	.0903	.0541	.0717	.0577	.2186
92	.0745	.0439	-.1600	-.1318	.0985	-.1381	-.2732	-.0779	.1299	-.0603	.0372	.0626	.2957
93	.0898	.2443	-.2055	-.1388	.3142	-.4562	-.5097	-.2449	.1648	.1624	.0792	.0908	.1747
94	.1713	.0997	-.1481	-.0421	.1262	-.2679	-.2350	-.1751	.0282	.0195	-.0741	-.0132	.1218
97	.2061	.1906	-.2181	-.1664	.2511	-.1448	-.2020	-.1758	.1960	.0780	.1020	.2289	.2287
98	-.0268	.0992	-.2188	-.1391	.2691	-.3159	-.3858	-.2576	.0865	.1187	-.0415	-.0131	.1716

*	35	38	39	1	3	4	5	22	46	80	87	7	8
2	.0708	.0427	.1062	.2252	.0356	-.0267	.1342	.2515	.0630	-.0268	.1583	.2123	.3123
11	.1378	.0713	.1323	.3692	-.1403	.1271	.1979	.3431	.1797	.1807	.3281	.3029	.2187
40	.2507	.1151	.3793	.2161	-.0864	.0062	.1466	.3638	.1501	.2138	.3149	.1735	.2793
43	.1262	-.0402	.1199	.0152	-.0571	.1502	-.0038	.1950	.0610	.0284	.1472	.0137	.1043
60	.1619	.1316	.1628	.3341	.1139	-.0688	.2112	.4360	.3680	.3243	.2570	.4055	.2668
88	.1322	.1002	.1785	.3151	.1457	-.0246	.1045	.4710	.2396	.2187	.4598	.2570	.1758
89	.0854	.0581	.1892	.1841	-.0881	.0507	.1443	.2436	.1013	.0203	.2752	.2596	.2300
90	.0902	.1534	.1061	.2268	-.0067	.0362	.2411	.3030	.2096	.1266	.2339	.2429	.2535
91	.0668	.0033	-.0063	.3261	.1872	-.0273	.1979	.3526	.1766	.2096	.2455	.3241	.2559
92	.1579	.0397	.0976	.1991	-.0101	-.0701	-.0797	.0819	-.0234	.0853	.0787	.0644	.1767
93	.0678	.0547	.0537	.3874	.1109	.2314	.1277	.4124	.2387	.2262	.2299	.2250	.2480
94	-.0356	-.0009	-.0111	.2450	.1171	-.0919	.1709	.2928	.2631	-.0021	.1588	.1844	.1008
97	.2558	.1413	.1448	.3286	.0679	.0566	.1406	.2931	.2529	.1361	.2298	.2057	.3201
98	.1148	.0396	.0882	.2494	.1517	.0700	.0848	.2722	.1724	.0677	.1998	.1582	.1927

*	9	15	47	48	12	13	23	27	31	41	42	68	29
2	.1908	.2611	.1066	.0815	-.0271	.2501	.1534	.0973	.1030	.2607	.1947	.2361	-.0448
11	.2682	.1607	.1951	.0423	.0580	.3539	.2818	.1612	.2232	.0595	.1753	.2782	.0119
40	.4384	.1353	.3796	.3048	-.0645	.3494	.1670	.2026	.2720	.3043	.4470	.3342	-.1161
43	.2929	.0869	.1608	.1329	-.1169	.2429	.0830	.2226	.1820	.1909	.2898	.1820	-.0976
60	.4559	.3328	.4098	.3011	-.1430	.4265	.2992	.2647	.3021	.2273	.5532	.4747	.0165
88	.1250	.1399	.2714	.1454	-.1482	.2334	.1963	.2566	.0991	.1759	.3720	.3995	.1266
89	.2901	.1895	.1814	.2456	-.0544	.2332	.1584	-.0249	.0950	.1044	.2076	.2639	.0467
90	.4425	.2867	.2622	.2137	-.2557	.3156	.3038	.1955	.0650	.2483	.5297	.3961	.0274
91	.3057	.2125	.3648	.2073	-.1463	.3488	.3186	.2749	.1864	.3041	.5291	.4486	.0732
92	.0727	.1977	.0761	.1741	-.0114	.0854	.0793	.0693	-.0132	.0805	.0876	.2144	.0669
93	.2903	.2641	.3063	.1774	-.0684	.3568	.2666	.1839	.1453	.1976	.4634	.4032	-.1216
94	.2490	.0925	.2146	.2208	-.1635	.2215	.1277	.0624	.1170	.1948	.3070	.2828	-.0879
97	.2200	.2197	.1158	.0765	.0514	.1892	.2241	.0587	.1318	.0564	.2524	.2315	.0837
98	.3377	.0965	.3196	.2736	-.1718	.4412	.1178	.0274	.1248	.2283	.3434	.2270	-.2159

*	30	19	20	32	73	76	78	100
2	.0787	.4865	.4034	.1077	.0228	.0361	-.1373	.0450
11	.0537	.3610	.2163	.1867	.1921	.1474	.0163	.1090
40	-.0669	.2905	.2641	.0855	.1667	-.0721	.0515	.0641
43	-.0952	.1697	.2463	-.0300	.0202	-.0364	.1305	.0237
60	.0211	.2268	.2219	.1562	.0573	.1285	-.0187	.0703
88	.0572	.2986	.2843	.1953	.1558	--0655	.1075	.1662
89	.0799	.2521	.2284	.0822	.1497	-.0692	-.0485	.0452
90	.0430	.3711	.3047	.1256	.0765	.1354	-.0615	.0783
91	.0382	.2543	.2957	.0928	.0356	.0698	.0216	.0458
92	.0931	.1504	.0450	.1456	.1256	.0233	.1958	.1147
93	-.0802	.3956	.2884	.0624	.0076	.0308	-.0364	.0734
94	-.0968	.2441	.1750	.1418	.0162	.0569	-.0729	-.0393
97	.0383	.2688	.3470	.1666	.1345	.0182	-.0442	.1935
98	-.1252	.2287	.2491	-.0154	.0396	-.1248	.0120	-.0054

Dimension 3: Information Flows Within Unit

3-1

★	6	10	14	25	45	49	50	51	53	59	77	95	96
44	.1103	.3393	.2457	.2734	.2614	.2512	.2588	.1890	.1410	.4352	.3616	.4284	.3037
54	.0885	.2243	.2215	.2401	.2985	.2643	.2682	.1244	.2637	.3175	.2963	.1700	.2967
55	.0015	.3232	.3730	.2739	.2213	.3668	.2932	.2423	.3442	.3966	.3321	.4044	.2828
56	-.0192	.2778	.2220	.2916	.2553	.2015	.1461	.1475	.1326	.2838	.3560	.3195	.3066
57	-.0405	.3068	.2983	.1700	.0804	.1135	.1881	.1296	.1514	.2623	.2026	.2305	.2350
61	-.0422	.2233	.2146	.3041	.1036	.1570	.1897	.2602	.2331	.2538	.2930	.2863	.2247
62	.0081	.0333	.0583	.0905	.1772	.1907	.0898	.0899	.0276	.2241	.1857	.1629	.1419
63	.1163	.3019	.1709	.3045	.1064	.2116	.2275	.2189	.1241	.1770	.2999	.3102	.3313
64	.0917	.2264	.1910	.2752	.1197	.1746	.1193	.2404	.1132	.2565	.2787	.3206	.2453
65	.0113	.0767	.0920	.2221	.1895	-.0117	-.0102	.2629	.0872	.1626	.2127	.2180	.2120
66	.0335	.1570	.2783	.2549	.1302	.2345	.0536	.0355	.1272	.1024	.1311	.1904	.1615
67	.1355	.2932	.3537	.0673	.0752	.3079	.1238	.2208	.2810	.1778	.3527	.2915	.1488
69	.1846	.2581	.3036	.2782	.2215	.2421	.1905	.2552	.3149	.4365	.3532	.3609	.3756
70	-.0227	.2660	.2572	.2538	.2753	.1374	.2158	.2313	.2280	.3725	.4673	.3750	.2966
71	.1364	.1535	.1836	.2034	.1965	.1414	.2252	.1088	.1525	.1947	.2119	.1956	.3674
74	.0411	.2218	.0819	.3982	.0913	.2359	.1074	.1219	.1766	.2173	.1502	.2520	.0852
75	.0522	.2281	.2265	.3682	.3188	.3605	.1814	.1772	.3275	.2735	.4391	.3161	.2033
86	.0605	.3600	.4090	.2233	.1419	.1401	.1219	.1827	.1353	.2812	.3618	.2879	.2542

*	99	2	11	40	43	60	88	89	90	91	92	93	94
44	.3273	.2614	.2181	.4436	.2549	.5088	.2470	.3327	.4353	.4718	.2575	.4339	.2419
54	.2543	.1486	.1375	.2295	.1110	.3138	.2981	.3026	.2924	.2009	.0468	.2581	.1610
55	.3092	.4140	.2766	.3703	.2560	.4620	.3219	.2690	.3045	.3074	.1937	.5000	.3140
56	.2411	.2323	.1596	.3789	.1887	.5094	.2788	.4338	.4319	.4563	.2894	.5030	.3192
57	.2230	.1594	.2120	.3058	.1199	.3339	.2464	.3051	.2649	.2198	-.0274	.2266	.1140
61	.2354	.1915	.1397	.2736	.0263	.3589	.1809	.2140	.2670	.1449	.0434	.1704	.1120
62	.3301	.1467	.0366	.3395	.0958	.2051	.1131	.1687	.2400	.1540	.1172	.2699	.1320
63	.4329	.1612	.0332	.2695	.1399	.3994	.2166	.2715	.4573	.3625	.1160	.3559	.2267
64	.1725	.1115	.1604	.3258	.0211	.4582	.2510	.1398	.4209	.2544	.2796	.2677	.1316
65	.1455	.0530	.1929	.1928	.0000	.3300	.1621	.0793	.2365	.1877	.1704	.1575	.0530
66	.1159	.0948	.2220	.1267	.0475	.2383	.1542	.1875	.3317	.1622	.2079	.3271	.1295
67	.3294	.1306	.0305	.1580	.0488	.2989	.2237	.1269	.2465	.1692	.1446	.2135	.1738
69	.3193	.1911	.2211	.4100	.2278	.6036	.3694	.2892	.3258	.3819	.1820	.3723	.2491
70	.3051	.1271	.1453	.4180	.2315	.4060	.2726	.1973	.3960	.3287	.1377	.3932	.2695
71	.2680	.0514	.1569	.3452	.1197	.4282	.3338	.3184	.3743	.3578	.2012	.2473	.1973
74	.1723	.0949	.1973	.2073	.0694	.2840	.1911	.2449	.1951	.3314	.0577	.2964	.2654
75	.3713	.1262	.1680	.2943	.1588	.3232	.2024	.2476	.3775	.3470	.1981	.4374	.2829
86	.2142	.2121	.1356	.2082	.0785	.3276	.3445	.1929	.2926	.2492	.2071	.3575	.2732

*	98	44	54	55	56	57	61	62	63	64	65	66	67
44	.4324	1.000	.2174	.3972	.5413	.3392	.2957	.3752	.4597	.4050	.2489	.2002	.3127
54	.1665	.2174	1.000	.3421	.1775	.4632	.3685	.2747	.2425	.1755	.1832	.1321	.2900
55	.5022	.3972	.3421	1.000	.3554	.3018	.3618	.4711	.2341	.3049	.1034	.1614	.3584
56	.4763	.5413	.1775	.3554	1.000	.2739	.3259	.3640	.4737	.4842	.3324	.3840	.3578
57	.2191	.3392	.4632	.3018	.2739	1.000	.3691	.3050	.2583	.3055	.2604	.1342	.3176
61	.3312	.2957	.3685	.3618	.3259	.3691	1.000	.5333	.4209	.5376	.4892	.1963	.4042
62	.3364	.3752	.2747	.4711	.3640	.3050	.5333	1.000	.4062	.3727	.2572	.1023	.3896
63	.3584	.4597	.2425	.2341	.4737	.2853	.4209	.4062	1.000	.4772	.3517	.2514	.4450
64	.2609	.4050	.1755	.3049	.4842	.3055	.5376	.3727	.4772	1.000	.6993	.4608	.3712
65	.1274	.2484	.1832	.1034	.3324	.2604	.4892	.2572	.3517	.6993	1.000	.4473	.2671
66	.0667	.2002	.1321	.1614	.3840	.1342	.1963	.1023	.2514	.4608	.4473	1.000	.2019
67	.1871	.3127	.2900	.3584	.3578	.3176	.4042	.3896	.4450	.3712	.2671	.3019	1.000
69	.3659	.3872	.3289	.3853	.4259	.3650	.4826	.3082	.3979	.4800	.4006	.2456	.5451
70	.4426	.4490	.4890	.4496	.5004	.4848	.4625	.3719	.3728	.4087	.3595	.2216	.3627
71	.1803	.2470	.3064	.1489	.3092	.1748	.2472	.2369	.3888	.3281	.3205	.2805	.2444
74	.2884	.2535	.2369	.3012	.2959	.2831	.3623	.2844	.3192	.3029	.2498	.2103	.3405
75	.3511	.4319	.2440	.2998	.4554	.1931	.2890	.2647	.4121	.2594	.2773	.2890	.3282
86	.3038	.3510	.1542	.3858	.3250	.3282	.3664	.3222	.4078	.3401	.2164	.1874	.3901

*	69	70	71	74	75	86	18	21	24	26	36	37	52
44	.3872	.4490	.2470	.2535	.4319	.3510	.0644	.1917	.3046	.1463	.1883	.0980	.0898
54	.3289	.4890	.3064	.2369	.2440	.1542	.0060	.2089	.1329	.2124	.0131	.1467	.1566
55	.3853	.4496	.1489	.3012	.2998	.3858	.0594	.1313	.1351	.1237	.0306	-.0869	.0594
56	.4259	.5004	.3092	.2959	.4553	.3250	.0750	.2462	.3204	.1906	.1313	.0793	.1099
57	.3650	.4848	.1748	.2831	.1931	.3282	.0579	.0657	.1507	.1639	.0374	.0487	.0603
61	.4826	.4625	.2472	.3623	.2890	.3664	.0742	.1002	.1653	.1206	.0374	.1205	.1046
62	.3082	.3719	.2369	.2844	.2647	.3222	-.0848	.0319	.0976	.0240	-.0070	.0620	-.0545
63	.3979	.3728	.3888	.3192	.4121	.4078	.0323	.1490	.3372	.2344	.1703	.1042	.2087
64	.4800	.4087	.3281	.3029	.2594	.3401	.0217	.0069	.2742	.2092	-.0260	.0591	.0766
65	.4006	.3595	.3205	.2498	.2773	.2164	.0148	.0156	.2520	.1900	.0434	.1927	.1322
66	.2456	.2216	.2805	.2103	.2890	.1874	-.0422	.0163	.1555	.2214	-.0492	-.0126	-.0144
67	.5451	.3627	.2444	.3405	.3282	.3901	-.0313	.1329	.1525	.0573	.0186	-.0621	.0155
69	1.000	.4640	.3934	.3403	.3611	.3175	.0514	.1887	.2307	.2369	.1655	.0705	.1256
70	.4640	1.000	.3574	.3613	.4344	.4478	.0226	.2475	.2157	.2304	.1784	.1400	.1719
71	.3934	.3574	1.000	.2550	.2172	.1242	.1418	.1750	.1846	.2024	.1327	.0026	.2627
74	.3403	.3613	.2550	1.000	.4712	.2718	.1008	.0628	.2067	.2315	.0970	-.0190	-.0228
75	.3611	.4344	.2172	.4712	1.000	.3472	.0874	.3004	.2359	.2298	.2548	.1445	.1062
86	.3175	.4478	.1242	.2718	.3472	1.000	.0418	.0545	.2191	.0690	.0755	-.0149	.0423

*	58	72	79	81	82	83	84	16	17	28	33	34	35
44	.2950	-.2283	-.1665	.3361	-.2422	-.2932	-.2864	.1957	.1414	.1084	.0350	.2906	.2063
54	.4088	-.0925	-.1019	.1989	-.3120	-.3088	-.2575	.0707	.0343	-.0393	-.0157	.2001	.1795
55	.2194	-.1714	-.1803	.2428	-.2885	-.3127	-.2515	.1986	.1703	.1316	.0415	.2668	.1408
56	.2196	-.2366	-.2733	.3336	-.3244	-.3656	-.2353	.0771	.0915	-.0397	.0388	.2151	.0353
57	.3871	-.1856	-.2184	.2793	-.3954	-.3136	-.3775	.0338	.0141	.0840	.0729	.1668	.1864
61	.1966	-.1782	-.2891	.2906	-.2706	-.2773	-.2507	.1736	.1545	.1159	-.0014	.2123	.1757
62	.2099	-.1151	-.1579	.1411	-.2750	-.2832	-.0830	.0825	.1356	.0133	-.0544	.0938	.1155
63	.2354	-.2363	-.2510	.3314	-.3501	-.4013	-.3242	.0249	.0145	-.0331	-.0141	.0558	.0917
64	.2852	-.2322	-.2738	.3257	-.2193	-.3179	-.2903	.2513	-.0021	.0478	.0961	.3176	.1197
65	.3024	-.1904	-.2592	.3271	-.1191	-.2058	-.1511	.1869	.0742	.0468	.0448	.1619	.0930
66	.1403	-.3366	-.2748	.2379	-.2910	-.3363	-.2066	.0839	-.1734	-.1389	.0296	.0407	.0009
67	.1927	-.1589	-.2226	.2414	-.2169	-.2928	-.1878	.1053	.1193	.0404	.0699	.1643	.1298
69	.2346	-.3218	-.4043	.4705	-.3083	-.4339	-.3909	.1384	.1227	.1114	.1475	.2934	.1549
70	.3806	-.2265	-.2972	.3514	-.3293	-.3494	-.3942	.0783	.1227	.0275	.1427	.2450	.2150
71	.3579	-.3132	-.3574	.3992	-.2529	-.3699	-.2890	.0174	.0157	-.1152	-.0275	.0180	.0433
74	.0784	-.2395	-.2303	.2792	-.4024	-.4001	-.2568	.0641	-.0267	.0814	.0170	.1564	-.0021
75	.3034	-.3542	-.1336	.2899	-.4010	-.4071	-.1951	.1221	.0654	.0439	.0421	.2027	.1541
86	.1480	-.2207	-.1502	.2449	-.3156	-.3684	-.2217	.1149	.0859	.0166	-.1094	.1602	-.0090

*	38	39	1	3	4	5	22	46	80	85	87	7	8
44	.0636	.2012	.3249	.1041	.0294	.2181	.3593	.1809	.2339	.2860	.1350	.2751	.3411
54	-.0016	.0721	.2370	-.0052	.0828	.1320	.2807	.1778	.2472	.4671	.2713	.0735	.1751
55	-.0175	.1562	.2382	.1510	.0323	.1790	.4296	.2559	.2188	.4096	.2801	.1930	.2235
56	.0697	.1133	.2637	.0500	-.0230	.1909	.3617	.1730	.2477	.2473	.0813	.3088	.1581
57	.0907	.2568	.2115	.1039	-.0101	.3683	.3301	.3266	.2542	.3803	.2821	.1045	.1771
61	.1499	.1835	.2771	.1822	-.1447	.2754	.1588	.2401	.1973	.2860	.1369	.1192	.1800
62	.0795	.1462	.0945	-.0059	.0263	.0239	.0612	.1192	.1919	.2611	.0748	.1161	.1523
63	.0483	.1362	.2067	.0316	-.0238	.0499	.1333	.0832	.1947	.2473	.1405	.2042	.1356
64	.1347	.2139	.2799	.2044	-.0712	.1875	.2839	.2025	.2879	.3373	.0984	.2263	.2205
65	.0949	.2101	.2602	.1417	-.1074	.1940	.1490	.1883	.2618	.3218	.0694	.1685	.1401
66	-.0060	.0302	.2015	.0925	.1023	.1645	.1378	.1020	.1978	.2131	.0290	.1003	.0242
67	-.0473	.1333	.1381	.1088	-.1003	.2292	.2303	.2277	.2197	.3068	.1560	.1577	-.0099
69	.0943	.2268	.2821	.2323	.0256	.2604	.4198	.2619	.3224	.3113	.2567	.2929	.1866
70	.1194	.2666	.3347	.1350	.0857	.3088	.3589	.2869	.3602	.4679	.2554	.0746	.2108
71	-.0201	.0844	.1495	.0022	-.0364	.1528	.1103	.1265	.2848	.2404	.1830	.2190	.0722
74	.0928	.1400	.1037	.0299	.0706	.2457	.1340	.0923	.1659	.2905	.1258	.1340	.0273
75	.1476	.2058	.2427	-.0287	.0693	.1488	.2069	.1031	.2080	.2757	.0706	.1059	.2286
80	.0791	.1973	.2546	.1877	-.1096	.0661	.3030	.2442	.1910	.3582	.1890	.2206	.1436

*	9	15	47	48	12	13	23	27	31	41	42	68	29
44	.4252	.1604	.4675	.3968	-.2209	.5947	.3975	.1067	.3449	.1816	.4136	.3145	-.1596
54	.2525	-.0054	.0683	.0603	-.0292	.0773	.3812	.0861	.1347	.1293	.2312	.2405	-.0784
55	.3071	.1457	.3587	.1312	.0732	.3389	.2409	.0573	.1608	.1466	.3688	.4260	-.1636
56	.3730	.3742	.3595	.3332	-.1597	.4546	.1842	.1361	.1166	.1947	.4634	.3501	-.0782
57	.2369	-.0318	.2236	.0696	-.0001	.2961	.2817	.2516	.1091	.1181	.3066	.1745	-.0717
61	.2663	-.0333	.2712	.1831	-.0015	.3394	.2195	-.0119	.1359	.1083	.2943	.2375	.0357
62	.1897	.0784	.3331	.2123	-.0561	.3208	.1432	-.1426	.1081	.0790	.2136	.2160	-.1553
63	.4626	.1167	.2569	.2798	-.0868	.3406	.1881	.0349	.0902	.2388	.4189	.3442	-.0100
64	.3696	.2322	.3765	.2390	-.0339	.3160	.1713	.1459	.1572	.2241	.3825	.3598	.0376
65	.1322	.0638	.2937	.1597	-.1122	.1834	.1792	.1674	.1264	.2144	.2850	.2424	.1078
66	.2319	.1695	.2426	.2427	.0174	.1330	.0806	.0961	-.0217	.1384	.1578	.1049	.0359
67	.1353	.0041	.1820	.2531	-.1132	.2503	.3299	.0355	.2168	.1686	.2923	.2864	.0623
69	.3743	.1244	.3960	.3662	-.0904	.3381	.3957	.2219	.4000	.2540	.5489	.4645	.0144
70	.3235	.0115	.3723	.1853	-.0952	.3221	.3337	.2971	.1328	.2399	.4931	.3913	-.0251
71	.4027	.2402	.2612	.3008	-.0884	.1394	.2546	.1063	.0787	.1496	.2348	.3728	.0712
74	.2783	.1109	.2006	.2793	.0345	.2101	.3359	.0798	.1793	.3032	.2928	.3022	.1168
75	.3139	.2033	.3417	.2175	-.1063	.2994	.3612	.1320	.1945	.1719	.4258	.3245	-.0927
86	.2023	-.1235	.2053	.0183	-.0990	.2872	.2192	.0503	.0740	.1203	.2060	.2444	-.0254

*	30	19	20	32	73	76	78	100
44	-.0285	.3418	.2723	-.1138	-.0033	.0590	.1324	.0691
54	-.0320	.0075	.1548	.1170	-.0932	.0171	.0562	.0677
55	-.0718	.2709	.3531	.1045	.1187	.0889	.0856	.1257
56	-.0960	.2079	.1966	-.0269	.0484	.0649	.0770	-.0290
57	-.0414	.0165	.0829	.0606	-.1055	-.1449	.0552	.1120
61	.0201	.1031	.1805	-.0225	-.0207	.0066	.0998	.1896
62	-.0420	.0965	.1047	-.0666	-.0010	-.0334	.1529	.1410
63	.0130	.1440	.1441	-.1055	.0232	-.0353	.0202	.0573
64	.0228	.1372	.1404	.0117	.0220	.0549	.1539	.1511
65	.0244	-.0104	.0676	-.0044	.0181	-.0378	.0936	.1850
66	.0154	.0808	.0382	-.0772	.0181	-.0066	.1191	.1180
67	.0544	.0152	.1245	-.1685	.0574	.0269	.0000	.0774
69	-.0095	.1023	.2045	.0368	.1052	.0247	-.0638	.1872
70	.0010	.1898	.2542	.0656	.0017	-.0871	.1038	.0071
71	-.0685	.0571	.0905	.0008	.0922	.0321	.1702	.0494
74	.1044	.0415	.0820	.0859	.1581	-.0205	.0112	.1439
75	.0713	.2511	.3017	.0020	.1117	.0842	.0794	.1496
86	.0648	.1989	.1900	-.0003	.0753	-.1569	.0043	.1411

Dimension 4: Employee Career Development

4-1

*	6	10	14	25	45	49	50	51	53	59	77	95	96
18	-.0511	.0865	.1583	.2056	-.0137	.0671	.1310	.0461	.1308	.1155	.0777	.0786	.1467
21	.0623	.2398	.3901	.2366	.1624	.2277	.3162	.3021	.3362	.2717	.2021	.2193	.2264
24	.1793	.2519	.1910	.3822	.1552	.1105	.1993	.1123	.2013	.2705	.2439	.2711	.2975
26	.0314	.2734	.2668	.4070	.1598	.2162	.3133	.3144	.2380	.2898	.3010	.3037	.3206
36	.0520	.0911	.1607	.1187	.1010	.0518	.2816	.3068	.2965	.2036	.1841	.0762	.2242
37	.0124	-.1037	-.0172	.1202	.2030	-.1376	.0633	.0564	.1144	.0823	.0517	.0140	.0907
52	.0532	.2512	.2710	.2656	.2647	.0660	.3870	.3699	.3385	.1517	.2625	.2448	.1209
58	.2241	.2374	.2620	.1439	.1851	.1561	.2462	.2525	.2557	.2566	.2510	.3194	.2514

*	99	2	11	40	43	60	88	89	90	91	92	93	94
18	-.1359	.0281	.0438	.0644	-.0537	.0644	.0060	.1100	.1379	.1639	.0960	.0976	.1413
21	-.0410	.1889	.1661	.2291	.0626	.1917	.2089	.3418	.3013	.2338	.3282	.2062	.2178
24	.0576	.2434	.1370	.2386	.1754	.3046	.1329	.1537	.2654	.3639	.2651	.2768	.1901
26	.0177	.1621	.1520	.1620	.0940	.1463	.2124	.1870	.2112	.3005	.2194	.2377	.3325
36	-.0464	.0812	.0260	.1631	.0350	.1883	.0131	.2169	.1996	.2324	.1424	.1387	.1843
37	-.0894	-.0625	-.0593	.0241	-.0985	.0980	.1467	.0173	.0089	.1234	.0855	.0235	-.0245
52	.0745	.0898	.1713	.2061	-.0268	.0898	.1566	.1662	.2815	.3684	.2524	.3110	.2143
58	.0439	.2443	.0997	.1906	.0992	.2950	.4088	.2760	.1661	.4394	.3001	.1815	.2485

*	97	98	44	54	55	56	57	61	62	63	64	65	67
18	.0895	-.0236	.1154	.1326	.0594	.0750	.0579	.0742	-.0848	.0323	.0217	.0148	-.0313
21	.2364	.2595	.2301	.3184	.1313	.2462	.0657	.1002	.0319	.1490	.0069	.0156	.1329
24	.2299	.2272	.2161	.2345	.1351	.3204	.1507	.1653	.0976	.3372	.2742	.2520	.1525
26	.2900	.2858	.2858	.3358	.1237	.1906	.1639	.1206	.0240	.2344	.2092	.1900	.0573
36	.2099	.2073	.1685	.2404	.0306	.1313	.0374	.0374	-.0070	.1703	-.0260	.0434	.0186
37	.0531	.1394	-.0023	.0678	-.0869	.0793	.0487	.1205	.0620	.1042	.0501	.1927	-.0621
52	.1628	.1806	.1660	.2942	.0504	.1099	.0609	.1046	-.0645	.2087	.0266	.1322	.0155
58	.1693	.0722	.3206	.3281	.2194	.2196	.3871	.1966	.2099	.2354	.2852	.3024	.1927

*	69	70	71	74	75	86	18	21	24	26	36	37	52
18	.0514	.0226	.1418	.1008	.0874	.0418	1.000	.3823	.2008	.3060	.3039	.3272	.2098
21	.1887	.2475	.1750	.0628	.3004	.0545	.3823	1.000	.2831	.3901	.4460	.3108	.3929
24	.2307	.2157	.1846	.2067	.2359	.2191	.2088	.2831	1.000	.4425	.3782	.3776	.3985
26	.2369	.2304	.2024	.2315	.2298	.0690	.3060	.3901	.4425	1.000	.4390	.4410	.4189
36	.1655	.1784	.1327	.0970	.2548	.55	.3039	.4460	.3782	.4390	1.000	.5221	.4378
37	.0705	.1400	.0026	-.0190	.1445	-.0149	.3272	.3108	.3776	.4410	.5221	1.000	.3319
52	.1256	.1719	.2427	-.0228	.1062	.0483	.2098	.3929	.3985	.4189	.4378	.3319	1.000
58	.2346	.3806	.3579	.0784	.3034	.1480	.1624	.2495	.2537	.2441	.1913	.2035	.2656

*	58	72	79	81	82	83	84	16	17	28	33	34	35
18	.1624	-.0260	.0619	.0171	.0234	-.0588	-.1726	.2350	.2966	.1190	.05462	.0003	-.0505
21	.2495	-.1719	-.1428	.2226	-.1201	-.0987	-.2214	.1788	.2339	.1382	.2475	.1696	.1764
24	.2537	-.2756	-.1496	.2212	-.3157	-.3222	-.2640	.0144	-.0083	.0649	-.0094	.0509	.0490
26	.2441	-.1587	-.0671	.2085	-.1826	-.1469	-.1173	.0579	.0485	.1109	.1816	.1114	.0122
36	.1913	-.0560	-.0461	.1031	-.0208	-.0562	-.0313	.1069	.1200	.1619	.3077	.2127	.2887
37	.2035	.0911	.1663	.0555	.0919	.0636	.0069	.0914	.1170	.0943	.0728	.0444	.1020
52	.2656	-.0135	-.1298	.1385	-.0434	-.0660	-.0981	.0307	.0578	.1145	.0543	-.0085	.0472
58	1.000	-.2954	-.1483	.2629	-.1927	-.2365	-.1327	.0073	.0928	.0580	.1093	.0558	.1755

*	38	39	1	3	4	5	22	46	80	85	87	7	8
18	.1949	.0841	.1840	.1233	-.0172	.1229	.3178	.1001	.0914	.0513	.0844	.2988	.1343
21	.1768	.0549	.2626	.0124	.0666	.2445	.4103	.1181	.1578	.2069	.2697	.3097	.2645
24	-.0049	.1067	.1410	-.0231	.0033	.0908	.1714	.1132	.0778	.2547	.1729	.2516	.3663
26	.1435	.1048	.1653	-.0458	.1066	.0570	.2439	-.0111	.1338	.1763	.1651	.1706	.2497
36	.2358	.3268	.2438	-.1152	.0306	-.0065	.1076	-.0121	.0208	.0472	.1349	.1368	.1029
37	.1541	.0817	.0923	-.0053	-.0487	-.1370	.0241	-.1072	-.0077	-.0137	.0193	-.0374	-.0724
52	.0446	.1929	.2064	-.0611	.0397	.1009	.1412	.1519	-.0010	.0779	.2552	.1234	.1570
58	-.0857	.1305	.2604	.0527	-.0559	.2608	.2264	.2876	.2159	.3570	.1646	.1632	.2235

*	9	15	47	48	12	13	23	27	31	41	42
18	.1343	.1161	.1085	-.1140	.0268	.1220	.2323	.2206	.1481	.0307	.0777
21	.2645	.1959	.1614	-.0167	-.0828	.2100	.2587	.1922	.2153	-.0299	.2129
24	.3663	.1575	.3681	.1610	-.0490	.2682	.3346	.0294	.1043	.1811	.1954
26	.2497	.0938	.2325	.0145	-.0203	.2120	.1407	.3624	.1456	.1587	.2715
36	.1029	.1041	.2001	.0070	.0299	.1798	.1557	.1248	.0969	.1163	.2843
37	-.0724	-.0095	.1338	-.0560	-.0565	.0874	.1057	.2228	.1240	.0483	.0609
52	.1570	.1268	.0372	-.0165	-.0225	.0862	.2345	.1719	-.0183	.0259	.0857
58	.2235	.2063	.3135	.0985	-.0917	.1741	.2891	.2790	.1611	.0523	.1846

*	68	29	30	19	20	32	73	76	78	100
18	.2733	.1759	.1513	.2560	.2645	.0249	.1458	-.0432	-.0330	.1806
21	.2540	.0113	.0473	.4381	.5625	.1211	.1465	.0340	.0174	.0943
24	.3589	-.0334	-.0994	.2895	.2464	-.0497	.0036	-.0811	-.0182	.0069
26	.3337	.2357	.2187	.2217	.2493	.0272	.1678	-.0400	.1468	.0168
36	.1925	.1959	.2497	.2424	.2764	.0548	.0882	-.0223	.0299	.0016
37	.1248	.1070	.1469	.0167	.1801	-.0996	-.0985	-.0505	.0550	.0706
52	.2812	.1740	.0539	.3192	.2914	.0689	.1397	-.0417	.0697	.0386
58	.2525	-.0267	-.0004	.1402	.1960	.0681	.0100	.1637	.1152	.0801

Dimension 5: Unit Adaptability

*	6	10	14	25	45	49	50	51	53	59	77	95	96
72	-.1611	-.1745	-.2565	-.2776	-.0799	-.3291	-.0871	-.1202	-.1614	-.1592	-.1844	-.1766	-.2275
79	.0128	-.1767	-.1615	-.1846	-.1377	-.1906	-.0811	-.2555	-.1827	-.1190	-.1931	-.1619	-.2406
81	.1180	.1638	.2904	.3024	.0760	.0489	.0646	.0725	.1515	.2377	.2465	.1949	.2226
82	-.0826	-.2620	-.1536	-.3134	-.1878	-.3041	-.1838	-.0757	-.1724	-.2475	-.2180	-.2049	-.2621
83	-.1860	-.2875	-.2180	-.3830	-.2980	-.3021	-.2057	-.0592	-.2738	-.2290	-.2917	-.2193	-.3527
84	-.1000	-.3644	-.2290	-.3336	-.1562	-.1580	-.2809	-.1193	-.3081	-.3123	-.2490	-.3586	-.2303

*	99	2	11	40	43	60	88	89	90	91	92	93	94
72	-.3721	-.1800	-.1218	-.1661	-.1781	-.2408	-.1351	-.1690	-.1626	-.1462	-.1600	-.2055	-.1481
79	-.2528	-.1033	-.1219	-.2029	-.1988	-.2454	-.1934	-.1731	-.1709	-.0654	-.1318	-.1388	-.0421
81	.1965	.1328	.2123	.2550	.1706	.3291	.3193	.1743	.3091	.3120	.0985	.3142	.1262
82	-.2852	-.1962	-.1424	-.2680	-.1998	-.3325	-.2812	-.3509	-.4245	-.3472	-.1381	-.4562	-.2679
83	-.4387	-.1714	-.2778	-.3089	-.2202	-.3198	-.3287	-.3199	-.3673	-.3946	-.2732	-.5097	-.2350
84	-.2647	-.0377	-.2218	-.2991	-.2151	-.2954	-.1872	-.1682	-.4217	-.3102	-.0779	-.2449	-.1751

*	97	98	44	54	55	56	57	61	62	63	64	65	66
72	-.0925	-.2188	-.2283	-.0925	-.1714	-.2366	-.1856	-.1782	-.1151	-.2863	-.2322	-.1994	-.3366
79	-.1019	-.1391	-.1665	-.1019	-.1803	-.2733	-.2184	-.2891	-.1579	-.2610	-.2738	-.2592	-.2748
81	.1989	.2691	.3361	.1989	.2428	.3336	.2793	.2906	.1411	.3314	.3257	.3271	.2379
82	-.3120	-.3159	-.2422	-.3120	-.2885	-.3244	-.3954	-.2706	-.2750	-.3501	-.2193	-.1191	-.2910
83	-.3088	-.3858	-.2932	-.2088	-.3127	-.3656	-.3136	-.2773	-.2832	-.4013	-.3179	-.2058	-.3363
84	-.2575	-.2576	-.2864	-.2575	-.2515	-.2353	-.3775	-.2507	-.0830	-.3242	-.2903	-.1511	-.2066

*	67	69	70	71	74	75	86	18	21	24	26	36	37
72	-.1589	-.3218	-.2265	-.3132	-.2395	-.3542	-.2207	-.0260	-.1719	-.2756	-.1587	-.0560	.0911
79	-.2226	-.4043	-.2972	-.3574	-.2303	-.1336	-.1502	.0619	-.1428	-.1496	-.0671	-.0461	.1663
81	.2414	.4705	.3514	.3992	.2792	.2899	.2449	.0171	.2226	.2212	.2085	.1031	.0555
82	-.2169	-.3083	-.3293	-.2529	-.4024	-.4010	-.3156	.0234	-.1201	-.3157	-.1826	-.0208	.0919
83	-.2928	-.4339	-.3494	-.3699	-.4001	-.4071	-.3684	-.0588	-.0987	-.3222	-.1469	-.0562	.0636
84	-.1878	-.3909	-.3942	-.2890	-.2568	-.1951	-.2217	-.1726	-.2214	-.2640	-.1173	-.0313	.0069

*	52	58	72	79	81	82	83	84	16	17	28	33	34
72	-.0135	-.2954	1.000	.3429	-.1972	.3688	.3691	.2684	.0151	.1017	.2079	-.0075	.0504
79	-.1298	-.1483	.3429	1.000	-.2812	.2389	.3231	.2624	-.0057	-.0360	-.0680	-.0318	-.0723
81	.1385	.2629	-.1972	-.2812	1.000	-.2097	-.4023	-.2937	-.0342	.0634	.0727	-.0410	.1354
82	-.0434	-.1927	.3688	.2389	-.2097	1.000	.7318	.4300	.1250	.1147	.1717	.1063	-.1218
83	-.0660	-.2365	.3691	.3231	-.4023	.7318	1.000	.4800	.1267	.0325	.1028	.0512	-.1410
84	-.0981	-.1327	.2684	.2624	-.2937	.4300	.4800	1.000	-.1086	.0487	-.1330	-.0846	-.2465

*	35	38	39	1	3	4	5	22	46	80	85	87	7
72	.1048	-.0046	-.0217	-.0842	-.0622	-.0145	-.1411	-.2053	-.0304	-.0969	-.2038	-.0883	-.2514
79	-.1233	.0078	-.2076	-.1205	-.0824	-.0692	-.2392	-.1524	-.1314	-.2960	-.0950	-.2463	-.1072
81	.0726	.1977	.1136	.2181	.1517	.0389	.1505	.2915	.1595	.4559	.2144	.2466	.1540
82	.0366	.0403	-.0848	-.0067	-.0408	-.0884	-.1628	-.1804	-.0697	-.1545	-.3525	-.0986	-.0827
83	-.0001	.0119	-.1925	-.1023	-.0286	-.1672	-.0983	-.2376	-.0415	-.2329	-.2588	-.2700	-.0415
84	-.0312	.0587	-.0723	-.1874	-.0063	-.1782	-.4368	-.2915	-.1341	-.1792	-.2464	-.3803	-.0933

*	8	9	15	47	48	12	13	23	27	31	41
72	-.2589	-.3490	-.0937	-.4254	-.4204	-.0232	-.1757	-.1419	-.0773	-.1059	-.0032
79	-.0081	-.4069	-.1603	-.2629	-.3223	.0328	-.2487	-.1364	-.0539	-.0223	-.1236
81	.1566	.3770	.1442	.2144	.1718	-.1719	.3095	.2717	.1307	.1898	.2269
82	-.1549	-.4612	-.1120	-.3323	-.1845	.0974	-.1969	-.2977	-.1375	-.0882	-.0346
83	-.1803	-.4615	-.0721	-.3263	-.2215	.1512	-.2877	-.4506	-.1058	-.2291	-.1131
84	-.1229	-.4057	-.1104	-.2612	-.0758	.0836	-.2899	-.3692	-.2412	-.1056	-.1550

*	42	68	29	30	19	20	32	73	76	78	100
72	-.1497	-.2282	.1355	.1389	-.1475	-.1228	-.0469	-.0788	.0670	-.0042	-.1341
79	-.2774	-.1901	.0541	.1051	-.0834	-.0018	-.0148	-.1079	-.0188	-.0303	-.1046
81	.3528	.2940	.0477	-.0057	.2241	.2455	-.0439	.0036	.0134	.1140	.0853
82	-.3615	-.2547	.1582	.2029	-.0884	-.1754	-.0208	-.0135	.0444	-.0923	-.1950
83	-.3300	-.3843	.1921	.2387	-.1812	-.1744	-.0532	-.0802	.0961	-.0885	-.0733
84	-.3454	-.3338	.1564	.1897	-.1795	-.1215	-.0702	.0009	-.0032	-.0337	-.1501

Dimension 6: Employee Professional Development

6-1

*	6	10	14	25	45	49	50	51	53	59	77	95	96
16	-.0852	.2000	.2338	-.0048	.0335	.1058	.0862	.0877	.0196	.1422	.2144	.2346	.0273
17	-.1741	.1143	.1938	.0782	.0519	.0658	.0467	.0936	-.0036	.1371	.2690	.1594	.1093
28	.0487	.1689	-.0487	.0680	-.0589	.0574	.1739	.1620	.0858	.1587	.0214	.0921	.1262
33	-.2223	.1348	.2591	.0117	-.0301	.0879	.1690	.1969	.1920	.2215	.2199	.1301	.0593
34	-.1368	.2968	.2236	.1472	.0221	.1350	.2502	.1843	.1601	.3599	.3124	.3204	.0957
35	-.1664	.1084	.2099	.0618	.0918	-.0033	.1416	.1644	.1690	.2160	.2278	.1808	.0270
38	-.1111	-.0653	.1189	.1283	-.0684	-.0569	.0247	.0721	-.0374	.0946	.0282	.1209	.0244
39	-.1796	.0093	.1528	.1813	.1064	.1402	.1413	.2237	.1465	.1594	.1757	.1598	.1744

*	99	2	11	40	43	60	88	89	90	91	92	93	94
16	-.1231	.0169	.1272	.0786	.0055	.1629	.0295	-.0093	.2307	.0903	.1299	.1648	.0282
17	.0476	.0893	.1366	.1791	.0063	.1314	.1924	.0013	.0756	.0541	-.0603	.1624	.0195
28	.0054	-.0273	.1699	.0805	.0879	.0414	.0710	-.0207	.0977	.0717	.0372	.0792	-.0741
33	.0503	-.0067	.1303	.1719	.1485	.1148	.1330	.0473	.0601	.0577	.0626	.0908	-.0132
34	-.0004	.0846	.2374	.3225	.1203	.2566	.2571	.0921	.2413	.2186	.2957	.1747	.1218
35	.0698	.0708	.1378	.2507	.1262	.1619	.1322	.0854	.0902	.0668	.1579	.0678	-.0356
38	-.0571	.0427	.0713	.1151	-.0402	.1316	.1002	.0581	.1534	.0033	.0397	.0547	-.0009
39	.1218	.1062	.1323	.3793	.1199	.1628	.1785	.1892	.1061	-.0063	.0976	.0537	-.0111

*	97	98	44	54	55	56	57	61	62	63	64	65	66
16	.1960	.0865	.1957	.0707	.1986	.0771	.0338	.1736	.0825	.0249	.2513	.1869	.0839
17	.0780	.1187	.1414	.0343	.1703	.0915	.0141	.1545	.1356	.0145	-.0021	-.0742	.1193
28	.1020	-.0415	.1084	-.0393	.1316	-.0397	.0840	.1159	.0133	-.0331	.0478	-.1389	.0404
33	.2289	-.0131	.0350	-.0157	.0415	.0388	.0729	-.0014	-.0544	-.0141	.0961	.0296	.0699
34	.2287	.1716	.2906	.2001	.2668	.2151	.1668	.2123	.0938	.0558	.3176	.0407	.1643
35	.2558	.1148	.2063	.1795	.1408	.0353	.1864	.1757	.1155	.0917	.1197	.0009	.1298
38	.1413	.0396	.0636	-.0016	-.0175	.0697	.0907	.1499	.0795	.0483	.1347	-.0060	-.0473
39	.1448	.0882	.2012	.0721	.1562	.1133	.2568	.1835	.1462	.1382	.2139	.0302	.1333

*	67	69	70	71	74	75	86	18	21	24	26	36	37
16	.1053	.1384	.0783	.0174	.0641	.1221	.1149	.2350	.1788	.0144	.0579	.1069	.0914
17	.1193	.1227	.1227	.0157	-.0267	.0654	.0859	.2966	.2339	-.0083	.0485	.1200	.1170
28	.0404	.1114	.0275	-.1152	.0814	.0439	.0166	.1190	.1382	.0649	.1109	.1619	.0943
33	.0699	.1475	.1427	-.0275	.0170	.0421	-.1094	.0462	.2475	-.0094	.1816	.3077	.0728
34	.1643	.2934	.2450	.0180	.1564	.2027	.1602	.0003	.1696	.0509	.1114	.2127	.0444
35	.1298	.1549	.2150	.0433	-.0021	.1541	-.0090	-.0505	.1764	.0490	.0122	.2887	.1020
38	-.0473	.0943	.1194	-.0201	.0928	.1476	.0791	.1949	.1768	-.0049	.1435	.2358	.1541
39	.1333	.2268	.2666	.0844	.1400	.1400	.1973	.0841	.0549	.1067	.1048	.3268	.0817

*	52	58	72	79	81	82	83	84	16	17	28	33	34
16	.0307	.0073	.0515	-.0057	-.0342	.1250	.1267	-.1086	1.000	.4349	.3374	.2880	.3991
17	.0578	.0928	.1017	-.0360	.0643	.1147	.0325	.0487	.4349	1.000	.2558	.2993	.2149
28	.1145	.0580	.2079	-.0680	.0727	.1717	.1028	-.1330	.3374	.2558	1.000	.2243	.3488
33	.0543	.1093	-.0075	-.0318	-.0410	.1063	.0512	-.0846	.2880	.2993	.2243	1.000	.3912
34	-.0085	.0558	.0504	-.0723	.1354	-.1218	-.1410	-.2465	.3991	.2149	.3488	.3912	1.000
35	.0472	.1755	.1048	-.1233	.0726	.0366	-.0001	-.0312	.2325	.2388	.1818	.5539	.4812
38	.0446	-.0857	-.0046	.0078	.1977	.0403	.0119	.0587	.3354	.1766	.0829	.1944	.2687
39	.1929	.1305	-.0217	-.2076	.1136	-.0848	-.1925	-.0723	.1791	.3241	.2473	.4054	.3797

*	35	38	39	1	3	4	5	22	46	80	85	87	7
16	.2325	.3354	.1791	.5194	.1706	-.0484	.1355	.3273	.2639	.1005	.2146	.1403	.3530
17	.2388	.1766	.3241	.3463	.1883	-.1037	.1468	.3524	.2527	.1250	.0768	.2154	.2059
28	.1818	.0829	.2473	.1953	.0284	-.0021	.1882	.1115	.0354	.0707	.0082	.1425	.0181
33	.5539	.1944	.4054	.4074	.1273	-.0842	.2523	.3082	.1169	.1866	.0820	.2601	.1010
34	.4812	.2687	.3797	.3797	.1588	-.1561	.2474	.3360	.1373	.2574	.1555	.2403	.1379
35	1.000	.2009	.4989	.4282	.0315	-.0231	.1847	.1701	.1286	.2214	.1231	.2539	.2177
38	.2009	1.000	.2295	.2072	.1261	.1150	-.0470	.1838	.0651	.0883	.0758	-.0386	.1944
39	.4989	.2295	1.000	.2655	.0090	.0180	.0652	.2459	.1011	.2619	.1022	.2077	.1720

*	8	9	15	47	48	12	13	23	27	31	41
16	.2231	.0845	.1742	.0854	.0499	-.0099	.1646	.1324	.1125	.0760	.0141
17	.2059	-.0194	.0597	.1040	.0349	.0357	.1479	.1358	.1591	.1822	.0006
28	.0181	-.0957	-.0252	-.1039	-.2066	-.0506	.1318	.1228	.1357	.2110	.0448
33	.1010	.0089	.1511	.0505	.0577	.1380	.0591	.0134	.2054	.0920	.0912
34	.1379	.1870	.0659	.0674	-.0091	-.0901	.1830	.1880	.1334	.2108	.2423
35	.2177	.1565	.1970	.0261	.0073	.0393	.1297	.0283	-.0319	.0831	.2128
38	.1944	.0608	.0879	.0724	.0302	.0018	.0794	.0564	.0591	-.0016	.1021
39	.1720	.1455	-.0260	.0940	.0760	.0223	.1640	.1076	.1139	.1621	.2209

*	42	68	29	30	19	20	32	73	76	78	100
16	.1389	.0570	.1029	.2613	.2109	.1806	.1849	-.0363	.1784	.0185	.0044
17	.0951	.1020	.1211	.1092	.2720	.2002	-.0128	.0051	.0759	.0128	.0597
28	.1454	.0810	.2949	.2802	.1873	.0816	.1640	.1275	.1626	-.0604	.1134
33	.1508	.0694	.2613	.2873	.2348	.2092	-.0186	.0186	.0847	-.0699	.0246
34	.3450	.2544	.0722	.2090	.2007	.2221	.0507	.0077	.1327	-.0546	-.0898
35	.2292	.1242	.0592	.1117	.2227	.2530	-.0699	-.0694	.0783	-.0578	.0201
38	.1446	.0403	.1597	.3574	.1134	.1514	.0743	-.1095	-.0761	-.1016	.0348
39	.2466	.1721	.0569	.1153	.1710	.2003	.0007	-.0092	-.0838	-.0333	.0928

Dimension 7: Unit Creativity

*	6	10	14	25	45	49	50	51	53	59	77	95	96
1	-.1134	.3415	.4385	.1447	.1822	.0167	.1762	.1041	.1660	.1686	.3841	.3183	.1989
3	-.1242	.0431	.2023	-.1496	-.0216	-.0855	-.0783	-.0846	-.1264	-.0011	.0905	.0339	.0914
4	.1481	.0286	-.0299	.1778	.1438	.0127	.1238	.1357	.0362	.0800	-.0074	.0967	.0419
5	.0895	.3818	.3245	.2621	.1127	.1587	.3126	.2157	.4014	.2614	.3115	.4137	.1466
22	-.0819	.3726	.4928	.3145	.1509	.2741	.2746	.1758	.2856	.3790	.3120	.3281	.3076
46	-.0837	.2357	.2636	.0121	.1016	.0434	.1125	.0350	.0392	.2275	.1289	.1875	.1924
80	-.1246	.0157	.2280	.1011	.1097	.1324	-.0402	-.0158	.0565	.1840	.2421	.0846	.1090
85	.0136	.2843	.3799	.3578	.2384	.2762	.2510	.2550	.2067	.3856	.4105	.3612	.3222
87	.0135	.4043	.4300	.2520	.2593	.1801	.3497	.2155	.3409	.2107	.3263	.3716	.1916

*	99	2	11	40	43	60	88	89	90	91	92	93	94
1	.0884	.2252	.3692	.2161	.0152	.3341	.3151	.1841	.2668	.3261	.1991	.3874	.2450
3	-.0367	.0356	-.1403	-.0864	-.0571	.1139	.1457	-.0881	-.0067	.1872	-.0101	.1109	.1171
4	.1366	-.0267	.1271	.0062	.1502	-.0688	-.0246	.0507	.0362	-.0273	-.0701	.2314	-.0919
5	.1668	.1342	.1979	.1466	-.0038	.2112	.1045	.1443	.2411	.1979	-.0797	.1277	.1709
22	.2471	.2515	.3431	.3638	.1950	.4360	.4710	.2436	.3030	.3526	.0819	.4124	.2928
46	-.0192	.0630	.1797	.1501	.0610	.3680	.2396	.1013	.3096	.1766	-.0234	.2387	.2631
80	.1630	-.0268	.1807	.2138	.0284	.3243	.2187	.0203	.1266	.2096	.0853	.2262	-.0021
85	.1575	.2495	.1816	.2902	.1442	.4421	.4178	.3405	.4596	.3285	-.0527	.4599	.3208
87	.3249	.1583	.3281	.3149	.1472	.2570	.4598	.2752	.2339	.2455	.0787	.2299	.1588

*	97	98	44	54	55	56	57	61	62	63	64	65	66
1	.3286	.2494	.3249	.2370	.2382	.2637	.2115	.2771	.0945	.2067	.2799	.2602	.2015
3	.0679	.1517	.1041	.0052	.1510	.0500	.1039	.1822	-.0059	.0316	.2044	.1417	.0925
4	.0566	.0700	.0294	.0828	.0323	-.0230	-.0101	-.1447	.0268	-.0238	-.0712	-.1074	.1023
5	.1406	.0848	.2181	.1320	.1790	.1909	.3683	.2754	.0239	.0499	.1875	.1940	.1645
22	.2931	.2722	.3593	.2807	.4296	.3617	.3301	.1588	.0612	.1333	.2839	.1490	.1378
46	.2529	.1724	.1809	.1778	.2559	.1730	.3266	.2401	.1192	.0832	.2025	.1883	.1020
80	.1361	.0677	.2339	.2472	.2188	.2477	.2542	.1973	.1919	.1947	.2879	.2618	.1978
85	.2929	.2867	.2860	.4671	.4096	.2473	.3803	.2860	.2611	.2473	.3373	.3218	.2131
87	.2298	.1998	.1350	.2713	.2801	.0813	.2821	.1369	.0748	.1405	.0984	.0694	-.0290

*	67	69	70	71	74	75	86	18	21	24	26	36	37
1	.1381	.2821	.3347	.1495	.1037	.2427	.2546	.1840	.2626	.1410	.1653	.2438	.0923
3	.1088	.2323	.1350	.0022	.0299	-.0287	.1877	.1233	.0124	-.0231	-.0458	-.1152	-.0053
4	-.1003	.0256	.0857	-.0364	.0706	.0693	-.1096	-.0172	.0666	.0033	.1066	.0306	-.0487
5	.2292	.2604	.3088	.1528	.2457	.1488	.0661	.1229	.2445	.0908	.0570	-.0065	-.1370
22	.2303	.4198	.3589	.1103	.1340	.2069	.3030	.3178	.4103	.1714	.2439	.1076	.0241
46	.2277	.2619	.2869	.1265	.0923	.1031	.2442	.1001	.1181	.1132	-.0111	-.0121	-.1072
80	.2197	.3224	.3602	.2848	.1639	.2080	.1910	.0914	.1578	.0778	.1338	.0208	-.0077
85	.3068	.3113	.4679	.2404	.2905	.2757	.3582	.0513	.2069	.2547	.1763	.0472	-.0137
87	.1560	.2567	.2554	.1830	.1258	.0706	.1890	.0844	.2697	.1729	.1651	.1349	.0193

*	52	58	72	79	81	82	88	84	16	17	28	33	34
1	.2064	.2604	-.0842	-.1205	.2181	-.0067	-.1023	-.1874	.5194	.3463	.1953	.4074	.3797
3	-.0611	.0527	-.0622	-.0824	.1517	-.0408	-.0286	-.0063	.1706	.1883	.0284	.1273	.1588
4	.0397	-.0559	-.0145	-.0692	.0389	-.0884	-.1672	-.1782	-.0484	-.1037	-.0021	-.0842	-.1561
5	.1099	.2608	-.1411	-.2392	.1505	-.1628	-.0983	-.4368	.1355	.1468	.1882	.2523	.2474
22	.1412	.2264	-.2053	-.1524	.2915	-.1804	-.2376	-.2915	.3273	.3524	.1115	.3082	.3360
46	.1519	.2876	-.0304	-.1314	.1595	-.0697	-.0415	-.1341	.2639	.2527	.0354	.1169	.1373
80	-.0010	.2159	-.0969	-.2960	.4559	-.1545	-.2329	-.1792	.1005	.1250	.0707	.1866	.2574
85	.0779	.3570	-.2038	-.0950	.2144	-.3525	-.2588	-.2464	.2146	.0768	.0082	.0820	.1555
87	.2552	.1646	-.0883	-.2463	.2466	-.0986	-.2770	-.3803	.1403	.2154	.1425	.2601	.2403

*	35	38	39	1	3	4	5	22	46	80	85	87	7
1	.4282	.2072	.2655	1.000	.3199	-.1047	.3186	.5229	.4349	.3090	.2308	.4040	.2998
3	.0315	.1261	-.0090	.3199	1.000	-.2968	.1596	.3057	.3153	.2469	.1470	.0482	.0540
4	-.0231	.1150	.0180	-.1047	-.2968	1.000	-.0475	-.0249	-.0837	-.1138	.0316	.0295	-.0150
5	.1847	-.0470	.0652	.3186	.1596	-.0475	1.000	.3225	.3055	.1006	.3133	.2515	.2127
22	.1701	.1838	.2459	.5229	.3057	-.0249	.3224	1.000	.4396	.3173	.4355	.3991	.4157
46	.1286	.0651	.1011	.4349	.3153	-.0837	.3055	.4396	1.000	.2380	.3243	.3295	.2912
80	.2214	.0883	.2619	.3090	.2469	-.1138	.1006	.3173	.2380	1.000	.2661	.2155	.1391
85	.1231	.0758	.1022	.2308	.1470	.0316	.3133	.4355	.3243	.2661	1.000	.3063	.2244
87	.2539	-.0386	.2077	.4040	.0482	.0295	.2515	.3991	.3295	.2155	.3063	1.000	.0871

*	8	9	15	47	48	12	13	23	27	31	41
1	.3067	.1999	.1818	.2515	.1391	-.0171	.3052	.2049	.1046	.1220	.1966
3	.1025	.0112	-.0208	.0776	.0342	-.0288	-.0378	-.0348	.1964	.0569	.0503
4	-.0134	.1099	.1024	-.0743	-.0646	.0711	.0573	.1397	-.0108	.0427	-.0244
5	.1050	.2211	.0312	.2093	.0746	-.0718	.2619	.3944	.1641	.0827	.1201
22	.4021	.2884	.1546	.3585	.2005	-.0559	.3734	.3396	.3123	.3107	.1381
46	.1122	.1681	.0705	.2887	.1414	-.0339	.1583	.1490	.0528	.0177	.1219
80	.1581	.2995	.0904	.2740	.0619	-.0026	.1635	.1427	.1190	.2190	.0859
85	.2182	.2392	.0560	.2521	.0606	-.1254	.2211	.2223	.1335	.0498	.0921
87	.1236	.1936	-.0491	.1679	.0230	-.0682	.2191	.2617	.0090	.0255	.1546

*	42	68	29	30	19	20	32	73	76	78	100
1	.2892	.1215	.1429	.1865	.3562	.2539	.0104	.0377	.0784	.1146	.0126
3	.1414	.0691	.2069	.1869	-.0192	.0779	-.0257	-.0706	-.0271	.0452	-.0368
4	.0439	-.0175	-.1647	-.1660	.1245	.0391	-.0134	.0009	-.0570	-.0714	.1284
5	.2391	.1748	.0120	.0034	.2596	.1117	-.0012	-.0819	.1742	-.0491	-.0984
22	.3667	.3246	.0201	.0591	.3905	.3997	.1403	.0925	-.0471	-.1047	.0241
46	.1489	.1184	-.0174	-.0530	.0380	.1133	.0622	.1070	-.0173	.0316	-.0391
80	.3271	.2914	.0423	.0056	.0581	.2085	.0373	.0026	-.0418	.1670	.1359
85	.3687	.2231	-.0067	.0621	.2012	.2252	.0785	.0150	.0126	-.0336	.0609
87	.1431	.2087	.0253	-.0601	.2580	.2553	.0772	.0767	-.1070	.0057	.0591

Dimension 8: Cooperation Within Unit

*	6	10	14	25	45	49	50	51	53	59	77	95	96
7	.2345	.2217	.2930	.2359	.0066	.1256	.1954	.1517	.0894	.2646	.1662	.3001	.1490
8	.0691	.1605	.2224	.2774	.1463	.1235	.2766	.1264	.0798	.2790	.2074	.2243	.1926
9	.2129	.3892	.2485	.4156	.2300	.2742	.3769	.2242	.1742	.3334	.2577	.3550	.3449
15	.0908	.2053	.1429	.1139	.0833	.0297	.1331	.1508	.0494	.1413	.2095	.1713	.1748
47	.0744	.0548	.1556	.2807	.2134	.1671	.1007	.0380	.1870	.2633	.1417	.2066	.1704
48	.0782	.0631	.0452	.1157	.0270	.2052	.0523	.0449	.0449	.1349	-.0064	.0789	.0296

*	99	2	11	40	43	60	88	89	90	91	92	93	94
7	.0726	.2123	.3029	.1735	.0137	.4055	.2570	.2596	.2429	.3241	.0644	.2250	.1844
8	.1315	.3123	.2187	.2793	.1043	.2669	.1758	.2300	.2535	.2559	.1767	.2480	.1008
9	.3688	.1908	.2682	.4384	.2929	.4559	.1250	.2901	.4425	.3057	.0727	.2903	.2490
15	-.0055	.2611	.1607	.1353	.0869	.3328	.1399	.1895	.2876	.2125	.1977	.2641	.0925
47	.3146	.1006	.1951	.3796	.1608	.4098	.2714	.1814	.2622	.3648	.0761	.3063	.2146
48	.1484	.0815	.0423	.3048	.1329	.3011	.1454	.2456	.2137	.2073	.1741	.1774	.2208

*	97	98	44	54	55	56	57	61	62	63	64	65	66
7	.2057	.1582	.2751	.0735	.1930	.3088	.1045	.1192	.1161	.2042	.2263	.1685	.1003
8	.3201	.1927	.3411	.1751	.2235	.1581	.1771	.1800	.1623	.1356	.2205	.1401	.0424
9	.2200	.3377	.4252	.2525	.3071	.3730	.2369	.2663	.1897	.4626	.3696	.1322	.2319
15	.2197	.0965	.1604	-.0054	.1457	.3742	-.0318	-.0333	.0784	.1167	.2322	.0638	.1695
47	.1158	.3196	.4675	.0683	.3587	.3595	.2236	.2712	.3331	.2569	.3765	.2937	.2426
48	.0765	.2736	.3968	.0603	.1312	.3332	.0696	.1831	.2123	.2798	.2390	.1597	.2427

*	67	69	70	71	74	75	86	18	21	24	26	36	37
7	.1577	.2929	.0746	.2190	.1346	.1059	.2206	.2988	.3097	.2516	.1706	.1368	-.0374
8	-.0099	.1866	.2108	.0722	.0273	.2286	.1436	.1907	.1815	.3342	.2244	.1829	.1520
9	.1353	.3743	.3235	.4027	.2783	.3139	.2023	.1343	.2645	.3663	.2497	.1029	-.0724
15	.0041	.1244	.0115	.2402	.1109	.2033	-.1235	.1161	.1959	.1575	.0938	.1041	-.0095
47	.1820	.3960	.3723	.2612	.2006	.3417	.2053	.1085	.1614	.3681	.2325	.2001	.1338
48	.2531	.3662	.1853	.3008	.2793	.2175	.0183	-.1140	-.0167	.1610	.0145	.0070	-.0560

*	52	58	72	79	81	82	83	84	16	17	28	33	34
7	.1234	.1632	-.2514	-.1072	.1540	-.0827	-.0415	-.0933	.3530	.2005	.0349	.0033	.1702
8	.1481	.2585	-.2589	.0081	.1566	-.1549	-.1803	-.1229	.2231	.2059	.0181	.1010	.1379
9	.1570	.2235	-.3490	-.4069	.3770	-.4612	-.4615	-.4057	.0845	-.0194	-.0957	.0089	.1870
15	.1268	.2063	-.0937	-.1603	.1442	-.1120	-.0721	-.1104	.1742	.0597	-.0252	.1511	.0659
47	.0372	.3135	-.4254	-.2629	.2144	-.3323	-.3263	-.2612	.0854	.1040	-.1039	.0505	.0674
48	-.0165	.0985	-.4204	-.3223	.1718	-.1845	-.2215	-.0758	.0499	.0349	-.2066	.0577	-.0091

*	35	38	39	1	3	4	5	22	46	80	85	87	7
7	.0837	.2048	.0904	.2998	.0540	-.0150	.2127	.4157	.2912	.1391	.2244	.0871	1.000
8	.2177	.1944	.1720	.3067	.1025	-.0134	.1050	.4021	.1122	.1581	.2182	.1236	.3424
9	.1565	.0608	.1455	.1999	.0112	.1099	.2211	.3884	.1681	.2995	.2392	.1936	.3768
15	.1970	.0879	-.0260	.1818	-.0208	.1024	.0312	.1546	.0705	.0904	.0560	-.0491	.2931
47	.0261	.0724	.0940	.2515	.0776	-.0743	.2093	.3585	.2887	.2740	.2521	.1679	.2884
48	.0073	.0302	.0760	.1391	.0342	-.0646	.0746	.2005	.1414	.0619	.0606	.0230	.2276

*	8	9	15	47	48	12	13	23	27	31	41
7	.3424	.3768	.2931	.2882	.2276	-.0396	.2615	.2713	.0727	.1338	.0715
8	1.000	.3873	.2052	.4129	.1412	.0919	.1994	.2842	.0931	.2019	.1460
9	.3873	1.000	.3704	.3766	.3145	.0393	.3767	.4161	.0079	.2471	.1273
15	.2052	.3704	1.000	.1174	.1514	.1278	.0778	.0824	.1167	.0141	.0813
47	.4129	.3766	.1174	1.000	.5408	-.0485	.4652	.2842	.0452	.2115	.0705
48	.1412	.3145	.1514	.5408	1.000	-.0151	.2884	.1174	-.0499	.1756	.1558

*	42	68	29	30	19	20	32	73	76	78	100
7	.1973	.2075	-.0035	.0558	.2747	.1643	.1635	.1703	.0017	-.1312	-.0704
8	.1621	.2622	-.0658	.0325	.3364	.2616	.0313	.1010	-.0650	-.0596	.0380
9	.4118	.3820	-.1891	-.2032	.3004	.2848	.1296	.0897	.0288	-.0306	-.0045
15	.2167	.1540	-.0022	-.0352	.2337	.1642	.1996	.1266	.0446	.0162	.0067
47	.3015	.3335	-.2858	-.1970	.1305	.1461	-.0569	.1844	-.0210	.1643	.0527
48	.1669	.1712	-.1230	-.0867	.0031	.0497	-.0454	.0524	.0574	-.0470	.0404

Dimension 9: Employee Motivation

9-1

*	6	10	14	25	45	49	50	51	53	59	77	95	96
12	-.0694	-.0748	.0172	-.0894	-.0945	-.1008	-.0229	-.0188	.0032	-.0741	-.1598	-.0453	-.1320
13	.0513	.3461	.2726	.3651	.1420	.2005	.2488	.2334	.2175	.3531	.2222	.3857	.2133
23	.3626	.3392	.2120	.3783	.3497	.1627	.3506	.2295	.4140	.3557	.2902	.3528	.3137
27	.0602	.2079	.2161	.1019	-.0110	.1363	.2306	.2603	.2159	.2603	.2238	.1927	.2316
31	.2448	.2295	.0913	.2654	.1146	.1334	.1040	.1641	.1580	.3135	.1640	.1812	.0941
41	.1727	.1880	.0786	.2531	.0051	.1020	.0642	.0715	.0928	.1740	.1554	.2436	.1385
42	.0377	.2578	.1920	.2580	.1938	.3071	.2842	.3137	.2631	.3809	.4173	.3757	.3465
68	.1525	.3126	.3029	.3960	.3199	.3833	.3920	.3526	.3848	.4525	.3633	.4119	.4480

*	99	2	11	40	43	60	88	89	90	91	92	93	94
12	-.1258	-.0271	.0580	-.0645	-.1169	-.1430	-.1482	-.0544	-.2557	-.1463	-.0114	-.0684	-.1635
13	.3975	.2501	.3539	.3494	.2429	.4265	.2334	.2332	.3156	.3488	.0854	.3568	.2215
23	.3698	.1534	.2818	.1670	.0830	.2992	.1963	.1584	.3038	.3186	.0793	.2666	.1277
27	.0998	.0973	.1612	.2026	.2226	.2647	.2566	-.0249	.1955	.2749	.0693	.1839	.0624
31	.1919	.1030	.2232	.2720	.1820	.3021	.0991	.0950	.0650	.1864	-.0132	.1453	.1170
41	.1076	.2607	.0595	.3043	.1909	.2273	.1759	.1044	.2483	.3041	.0805	.1976	.1948
42	.3831	.1947	.1753	.4470	.2898	.5532	.3720	.2076	.5297	.5291	.0876	.4643	.3070
68	.3346	.2361	.2782	.3342	.1820	.4747	.3995	.2639	.3961	.4486	.2144	.4032	.2828

*	97	98	44	54	55	56	57	61	62	63	64	65	66
12	.0514	-.1718	-.2209	-.0292	.0732	-.1597	-.0001	-.0015	-.0561	-.0868	-.0339	-.1122	.0174
13	.1892	.4412	.5947	.0773	.3389	.4546	.2961	.3394	.3208	.3406	.3160	.1834	.1330
23	.2241	.1178	.3975	.3812	.2409	.1842	.2817	.2195	.1432	.1881	.1713	.1792	.0906
27	.0587	.0274	.1067	.0861	.0573	.1361	.2516	-.0119	-.1426	.0349	.1459	.1674	.0961
31	.1318	.1248	.3449	.1347	.1608	.1166	.1091	.1359	.1081	.0902	.1572	.1264	-.0217
41	.0564	.2283	.1816	.1293	.1466	.1947	.1181	.1083	.0790	.2388	.2241	.2144	.1384
42	.2524	.3434	.4136	.2312	.3688	.4643	.3066	.2943	.2136	.4189	.3825	.2850	.1578
68	.2315	.2270	.3145	.2405	.4260	.3501	.1745	.2375	.2160	.3442	.3598	.2424	.1649

*	67	69	70	71	74	75	86	18	21	24	26	36	37
12	-.1132	-.0904	-.0952	-.0884	.0345	-.1063	-.0990	.0268	-.0828	-.0490	-.0203	.0299	-.0565
13	.2503	.3381	.3221	.1394	.2101	.2994	.2872	.1220	.2100	.2682	.2120	.1798	.0874
23	.3299	.3957	.3337	.2546	.3359	.3612	.2192	.2323	.2587	.3346	.1407	.1557	.1057
27	.0355	.2219	.2971	.1063	.0798	.1320	.0503	.2206	.1922	.0294	.3624	.1248	.2228
31	.2168	.4000	.1328	.0787	.1793	.1945	.0740	.1481	.2153	.1043	.1456	.0969	.1240
41	.1686	.2540	.2399	.1496	.3032	.1719	.1203	.0307	-.0299	.1811	.1587	.1163	.0483
42	.2923	.5489	.4931	.2348	.2928	.4258	.2060	.0777	.2129	.1954	.2715	.2843	.0609
68	.2864	.4645	.3913	.3728	.3022	.3245	.2444	.2733	.2540	.3589	.3337	.1925	.1248

*	52	58	72	79	81	82	83	84	16	17	28	33	34
12	-.0225	-.0917	-.0232	.0328	-.1719	.0974	.1512	.0836	-.0099	.0357	-.0506	.1380	-.0901
13	.0862	.1741	-.1757	-.2487	.3095	-.1969	-.2877	-.2899	.1646	.1479	.1318	.0591	.1830
23	.2345	.2891	-.1419	-.1364	.2717	-.2977	-.4506	-.3692	.1324	.1358	.1228	.0134	.1880
27	.1719	.2790	-.0773	.0539	.1307	-.1375	-.1058	-.2412	.1125	.1591	.1357	.2054	.1334
31	-.0183	.1611	-.1059	.0223	.1898	-.0882	-.2291	-.1056	.0760	.1822	.2110	.0920	.2108
41	.0259	.0523	.0032	-.1236	.2269	-.0346	-.1131	-.1550	.0141	.0006	.0448	.0912	.2423
42	.0857	.1846	-.1497	-.2774	.3528	-.3615	-.3300	-.3454	.1389	.0951	.1454	.1508	.3450
68	.2812	.2525	-.2282	-.1901	.2940	-.2547	-.3843	-.3338	.0570	.1020	.0810	.0694	.2544

*	35	38	39	1	3	4	5	22	46	80	85	87	7
12	.0393	.0018	.0223	-.0171	-.0288	.0711	-.0718	-.0559	-.0339	-.0026	-.1254	-.0682	-.0396
13	.1297	.0794	.1640	.3052	-.0378	.0573	.2619	.3734	.1583	.1635	.2211	.2191	.2615
23	.0283	.0564	.1076	.2049	-.0348	.1397	.3944	.3396	.1490	.1427	.2223	.2617	.2713
27	-.0319	.0591	.1139	.1046	.1964	-.0108	.1641	.3123	.0528	.1190	.1335	.0090	.0727
31	.0831	-.0016	.1621	.1220	.0569	.0427	.0827	.3107	.0177	.2190	.0498	.0255	.1338
41	.2128	.1021	.2209	.1966	.0503	-.0244	.1201	.1381	.1219	.0859	.0921	.1546	.0715
42	.2292	.1446	.2466	.2892	.1414	.0439	.2391	.3667	.1489	.3271	.3687	.1431	.1973
68	.1242	.0403	.1721	.1215	.0691	-.0175	.1748	.3246	.1184	.2914	.2231	.2087	.2075

*	8	9	15	47	48	12	13	23	27	31	41
12	.0919	.0393	.1278	-.0485	-.0151	1.000	-.3638	-.0994	-.1095	-.1881	-.1236
13	.1994	.3767	.0778	.4652	.2884	-.3638	1.000	.3150	.1276	.3065	.2004
23	.2842	.4161	.0824	.2842	.1174	-.0994	.3150	1.000	.1272	.4302	.0852
27	.0931	.0079	.1167	.0452	-.0499	-.1095	.1276	.1272	1.000	.2134	.2291
31	.2019	.2471	.0141	.2115	.1756	-.1881	.3065	.4302	.2134	1.000	.1414
41	.1460	.1273	.0813	.0705	.1558	-.1236	.2004	.0852	.2291	.1414	1.000
42	.1621	.4118	.2167	.3015	.1669	-.2123	.4270	.2123	.3502	.2182	.4164
68	.2622	.3820	.1540	.3335	.1712	-.1149	.2831	.4102	.3071	.3288	.2567

*	42	68	29	30	19	20	32	73	76	78	100
12	-.2123	-.1149	-.0271	.0274	-.0067	.0194	-.0655	.0540	.0204	-.0211	.0095
13	.4270	.2831	-.1632	-.1156	.2665	.1430	-.0030	-.0295	.1013	.0474	.1215
23	.2123	.4102	-.0828	-.0242	.2367	.2070	.1127	.0574	.0716	-.0182	.1387
27	.3502	.3071	.2285	.1725	.0128	.0912	.1432	-.0267	.0659	.0352	.1905
31	.2182	.3288	.0846	.0456	.0716	.2131	.1263	.0522	.0992	-.0277	.1773
41	.4164	.2567	.0910	.0838	.0705	.0775	-.0041	.0252	-.0769	-.0834	.0260
42	1.000	.4227	.0023	-.0244	.1882	.2415	.1200	.0093	.1257	-.0860	.0942
68	.4227	1.000	.0645	.0498	.2431	.2614	.0241	.0311	.1029	-.0051	.0498

Dimension 10: Degree of Unit's Work Efficiency

*	6	10	14	25	45	49	50	51	53	59	77	95	96
29	-.0094	.0876	.0270	.0468	-.0174	.0528	.0833	.2725	.0200	-.0107	.0561	.0898	.0312
30	-.0005	.0534	.1545	-.0017	-.0677	.1143	.1660	.2259	.0907	.1284	.1750	.1290	.0246

*	99	2	11	40	43	60	88	89	90	91	92	93	94
29	-.1411	-.0448	.0119	-.1161	-.0967	.0165	.1266	.0467	.0274	.0732	.0669	-.1216	-.0879
30	-.1756	.0787	.0537	-.0669	-.0952	.0211	.0572	.0799	.0430	.0382	.0931	-.0802	-.0968

*	97	98	44	54	55	56	57	61	62	63	64	65	66
29	.0837	-.2159	-.1596	-.0784	-.1636	-.0782	-.0717	.0357	-.1553	-.0100	.0376	.1078	.0359
30	.0383	-.1252	-.0285	-.0320	-.0718	-.0960	-.0414	.0201	-.0420	.0130	.0228	.0244	.0154

*	67	69	70	71	74	75	86	18	21	24	26	36	37
29	.0623	.0114	-.0251	.0712	.1168	-.0927	-.0254	.1759	.0113	-.0334	.2357	.1959	.1070
30	.0544	-.0095	.0010	-.0685	.1044	.0713	.0648	.1513	.0473	-.0994	.2187	.2497	.1469

*	52	58	72	79	81	82	83	84	16	17	28	33
29	.1740	-.0267	.1355	.0541	.0477	.1582	.1921	.1564	.1029	.1211	.2949	.2613
30	.0539	-.0004	.1389	.1051	-.0057	.2029	.2387	.1987	.2613	.1092	.2802	.2873

*	34	35	38	39	1	3	4	5	22	46	80	85
29	.0722	.0592	.1597	.0569	.1429	.2069	-.1647	.0120	.0201	-.0174	.0423	-.0067
30	.2090	.1117	.3574	.1153	.1865	.1869	-.1660	.0034	.0591	-.0530	.0056	.0621

*	87	7	8	9	15	47	48	12	13	23	27	31
29	.0253	-.0035	-.0658	-.1891	-.0022	-.2858	-.1230	-.0271	-.1632	-.0828	.2285	.0846
30	-.0601	.0558	.0325	-.2032	-.0352	-.1970	-.0867	.0274	-.1156	-.0242	.1725	.0456

*	41	42	68	29	30	19	20	32	73	76	78	100
29	.0910	.0023	.0645	1.000	.6476	-.0433	.0228	.1107	.0490	-.0489	-.0105	.0277
30	.0838	-.0244	.0498	.6476	1.000	.0716	.0703	.1397	.0398	-.0316	.0114	.1094

Dimension 11: Achievement Recognition Within Unit

*	6	10	14	25	45	49	50	51	53	59	77	95	96
29	.0695	.4246	.4998	.2608	.2109	.2394	.3619	.2522	.2722	.2921	.4032	.4215	.2796
30	.0110	.2535	.4931	.2095	.2763	.2217	.2943	.2866	.2320	.2570	.4115	.3801	.2689

*	99	2	11	40	43	60	88	89	90	91	92	93	94
29	.2928	.4865	.3610	.2905	.1697	.2268	.2986	.2521	.3711	.2543	.1504	.3956	.2441
30	.3283	.4034	.2163	.2641	.2463	.2219	.2843	.2284	.3047	.2957	.0450	.2884	.1750

*	97	98	44	54	55	56	57	61	62	63	64	65	66
29	.2688	.2287	.3418	.0075	.2709	.2079	.0165	.1031	.0965	.1440	.1372	-.0104	.0808
30	.3470	.2491	.2723	.1548	.3531	.1966	.0829	.1805	.1047	.1441	.1404	.0676	.0382

*	67	69	70	71	74	75	86	18	21	24	26	36	37
29	.0152	.1023	.1898	.0571	.0415	.2511	.1989	.2560	.4381	.2895	.2217	.2424	.0167
30	.1245	.2045	.2542	.0905	.0820	.3017	.1900	.2645	.5625	.2464	.2493	.2764	.1801

*	52	53	72	79	81	82	83	84	16	17	28	33
29	.3192	.1402	-.1475	-.0834	.2241	-.0884	-.1812	-.1795	.2109	.2720	.1873	.2348
30	.2914	.1960	-.1228	-.0018	.2455	-.1754	-.1744	-.1215	.1806	.2002	.0816	.2092

*	34	35	38	39	1	3	4	5	22	46	80	85
29	.2007	.2227	.1134	.1710	.3562	-.0192	.1245	.2596	.3905	.0380	.0581	.2012
30	.2221	.2530	.1514	.2003	.2539	.0779	.0391	.1117	.3997	.1133	.2085	.2252

*	87	7	8	9	15	47	48	12	13	23	27	31
29	.2580	.2747	.3364	.3004	.2337	.1305	.0031	-.0067	.2665	.2367	.0128	.0716
30	.2553	.1643	.2616	.2848	.1642	.1461	-.0497	.0194	.1430	.2070	.0912	.2131

*	41	42	68	29	30	19	20	32	73	76	78	100
29	.0705	.1882	.2431	-.0433	.0716	1.000	.6217	.0580	.1072	-.0496	-.0879	.0845
30	.0775	.2415	.2614	.0228	.0703	.6217	1.000	.0618	.0771	-.0596	-.1069	.1281

Items Eliminated From Further Analysis

*	6	10	14	25	45	49	50	51	53	59	77	95	96
32	-.0620	.0982	.0418	.0491	.0033	.1581	.1692	.1727	.1806	.1985	.0899	.0707	.1857
73	.0338	.0975	-.0334	.1275	-.0306	.0528	.0946	.0914	.0217	.0838	.0258	.0147	.0930
76	-.0080	.0435	.0479	-.0720	-.0400	.1127	.1295	.1545	.1682	.0089	.1007	.1322	.0370
78	-.0511	-.1098	-.0089	-.0107	.0512	-.1406	-.0927	-.0738	.0129	-.0157	.0953	-.1190	-.1534
100	.0278	.0450	.0736	.1871	.1345	.1180	.0146	.0805	.0173	.1588	.1298	.1394	.0925

*	99	2	11	40	43	60	88	89	90	91	92	93	94
32	-.0087	.1077	.1867	.0855	-.0300	.1562	.1953	.0822	.1256	.0928	.1456	.0624	.1418
73	.0482	.0228	.1921	.1667	.0202	.0573	.1558	.1497	.0765	.0356	.1256	.0076	.0162
76	-.1104	.0361	.0474	-.0721	-.0364	.1285	-.0655	-.0692	.1354	.0698	.0233	.0308	.0569
78	-.0800	-.1373	.0163	.0515	.1305	-.0187	.0175	-.0485	-.0615	.0216	.1958	-.0364	-.0729
100	.0010	.0450	.1090	.0641	.0237	.0703	.1662	.0452	.0783	.0458	.1147	.0734	-.0393

*	97	98	44	54	55	56	57	61	62	63	64	65	66
32	.1666	-.0154	-.1138	.1170	.1045	-.0269	.0606	.0225	-.0666	-.1055	.0117	-.0044	-.0772
73	.1345	.0396	-.0033	-.0932	.1187	.0484	-.1055	.0207	-.0010	.0232	.0220	.0185	.0181
76	.0182	-.1248	.0590	.0171	.0889	.0649	-.1449	.0066	-.0334	-.0353	.0549	-.0378	-.0066
78	-.0442	.0120	.1324	.0562	.0856	.0770	.0552	.0998	.1529	.0202	.1539	.0936	.1191
100	.1935	-.0054	.0691	.0677	.1257	-.0290	.1120	.1896	.1410	.0573	.1511	.1850	.1180

*	67	69	70	71	74	75	86	18	21	24	26	36	37
32	-.1685	.0368	.0656	.0008	.0859	.0020	-.0003	.0249	.1211	-.0497	.0272	.0548	-.0996
73	.0574	.1052	.0017	.0922	.1581	.1117	.0753	.1458	.1465	.0036	.1678	.0882	-.0985
76	.0269	.0247	-.0871	.0321	-.0205	.0842	-.1569	-.0432	.0340	-.0811	-.0400	-.0223	-.0505
78	.0000	-.0638	.1038	.1702	.0112	.0794	.0043	-.0330	.0174	-.0182	.1468	.0299	.0550
100	.0774	.1872	.0071	.0494	.1439	.1496	.1411	.1806	.0943	.0069	.0168	.0016	.0706

*	52	58	72	79	81	82	83	84	16	17	28	33
32	.0689	.0681	-.0469	-.0148	-.0439	-.0208	-.0532	-.0702	.1849	-.0128	.1640	-.0186
73	.1397	.0100	-.0788	-.1079	.0036	-.0135	-.0802	.0009	-.0363	.0051	.1275	.0286
76	-.0417	.1637	.0670	-.0188	.0134	.0444	.0961	-.0032	.1784	.0759	.1626	.0847
78	.0697	.1152	-.0042	-.0303	.1140	-.0923	-.0885	-.0337	.0185	.0128	-.0604	-.0699
100	.0386	.0801	-.1341	-.1046	.0853	-.1950	-.0733	-.1501	.0044	.0597	.1134	.0246

*	34	35	38	39	1	3	4	5	22	46	80	85
32	.0507	-.0699	.0743	.0007	.0104	-.0257	-.0134	-.0012	.1403	.0622	.0373	.0785
73	.0077	-.0694	-.1095	-.0092	.0377	-.0706	.0009	-.0819	.0925	.1070	.0026	.0150
76	.1327	.0783	-.0761	-.0838	.0784	-.0271	-.0570	.1742	-.0471	-.0173	-.0418	.0126
78	-.0546	-.0578	-.1016	-.0033	.1146	.0452	-.0714	-.0491	-.1047	.0316	.1670	-.0336
100	-.0898	.0201	.0348	.0928	.0126	-.0368	.1284	-.0984	.0241	-.0391	.1359	.0609

*	87	7	8	9	15	47	48	12	13	23	27	31
32	.0772	.1635	.0313	.1296	.1996	-.0569	-.0454	-.0655	-.0030	.1127	.1432	.1263
73	.0767	.1703	.1010	.0897	.1266	.1844	.0524	.0540	-.0295	.0574	-.0267	.0522
76	-.1070	.0017	-.0650	.0288	.0446	-.0210	.0574	.0204	.1013	.0716	.0659	.0992
78	.0057	-.1312	-.0596	-.0306	.0162	.1643	-.0470	-.0211	.0474	-.0182	.0352	-.0277
100	.0591	-.0704	.0380	-.0045	.0067	.0527	.0404	.0095	.1215	.1387	.1905	.1773

*	41	42	68	29	30	19	20	32	73	76	78	100
32	-.0041	.1200	.0241	.1107	.1397	.0580	.0618	1.000	.0652	.1180	-.0611	.0818
73	.0252	.0093	.0311	.0490	.0398	.1072	.0771	.0652	1.000	-.0103	-.0320	.1435
76	-.0769	.12257	.1029	-.0489	-.0316	-.0496	-.0596	.1180	-.0103	1.000	.1549	-.0193
78	-.0834	-.0860	-.0051	-.0105	.0114	-.0879	-.1069	-.0611	-.0320	.1549	1.000	.1553
100	.0260	.0942	.0498	.0277	.1094	.0845	.1281	.0818	.1435	-.0193	.1553	1.000

APPENDIX VII:
VARIMAX FACTOR ANALYSIS
OF ELEVEN EFFECTIVENESS DIMENSIONS

Table 18: Varimax Factor Analysis
Of the Eleven Effectiveness Dimensions

Organizational Synergy

Items	1	2	3	4	5	6	7	8	9	10	11
X0101	.313	-.067	.024	.059	.092	-.331	-.126	.162	.221	-.005	-.019
X0102	.667	.335	.050	-.056	.093	.023	.196	.094	.122	.066	.088
X0103	.486	.318	.079	.098	.123	.120	.401	.069	-.192	.080	.287
X0104	.316	.210	.143	.243	.300	.024	-.053	.181	.193	-.039	.057
X0105	.252	.211	.182	.210	.108	.015	.008	-.035	.0012	-.146	.037
X0106	.546	.162	.194	-.041	.169	-.022	-.087	.046	.085	.029	.112
X0107	.731	.286	-.006	.187	-.029	.095	-.018	.036	.119	-.019	-.047
X0108	.725	.139	.165	.188	-.106	.156	-.107	.033	.046	.177	-.111
X0109	.590	-.043	.100	.190	.251	.124	.029	-.036	.068	.003	.034
X0110	.410	.378	.163	.103	.031	.196	.107	.083	.293	-.027	-.028
X0111	.476	.179	.324	.076	.139	.167	.156	-.051	.028	.091	.284
X0112	.690	.282	.210	.020	.005	.127	.084	.149	.155	.078	.139
X0113	.502	.315	.207	.281	.075	-.073	.100	.039	.045	.007	-.071
X0114	.427	.059	.327	.234	.266	-.061	-.059	-.019	.101	-.266	.141

Unit Health

Items	1	2	3	4	5	6	7	8	9	10	11
X0201	.403	.430	.077	.147	-.108	-.023	.046	.123	-.106	-.027	.203
X0202	.356	.346	-.104	.111	.128	.165	.157	.217	.052	-.002	.025
X0203	.191	.444	.225	.133	.064	.347	-.026	.165	.239	-.235	.025
X0204	.134	.380	-.013	.167	.023	.179	-.137	.033	.207	-.216	-.082
X0205	.240	.587	.300	.090	.047	.090	.245	.299	.230	.006	-.160
X0206	.188	.533	.078	.235	.212	.075	.315	-.019	-.013	.115	-.001
X0207	.242	.581	.121	.184	.085	-.001	.036	.110	-.097	-.047	-.024
X0208	.319	.548	.242	.090	.178	.004	.088	.164	.119	.069	.011
X0209	.065	.635	.113	.171	.208	-.028	.156	.134	.290	.079	.049
X0210	-.004	.402	.094	-.136	.131	.183	-.120	.211	-.084	.154	-.013
X0211	.147	.646	.189	-.013	.272	.018	.143	.083	.094	-.047	.251
X0212	.174	.522	.120	-.003	.030	-.100	.133	.052	.075	-.072	.063
X0213	.238	.408	.133	.077	.046	.232	.136	.129	-.067	.010	.084
X0214	.024	.458	.372	-.092	.068	.074	.014	.064	.179	-.260	.208

Information Flows Within Unit

Items	1	2	3	4	5	6	7	8	9	10	11
X0301	.137	.334	.431	.077	.018	.123	.066	.280	.332	-176	.161
X0302	.218	.168	.324	.168	.218	.046	.241	-207	.011	-141	-113
X0303	.274	.358	.376	-.080	.061	.131	.184	.000	.107	.202	.203
X0304	.019	.431	.452	.080	.168	.035	.039	.293	.107	-.024	.089
X0305	.150	.144	.356	.061	.221	.128	.358	-113	.092	-146	-171
X0306	.167	.011	.673	.051	.048	.123	.177	.065	.039	.004	-.023
X0307	.107	.142	.665	-.016	-.066	.063	-.029	.026	.046	-217	.070
X0308	.125	.218	.567	.155	.201	-.046	-.068	.178	.061	.016	.015
X0309	.072	.134	.588	-.009	.168	.114	.139	.369	.071	.187	-116
X0310	.002	.015	.539	.153	.134	.085	.167	.242	.004	.221	-219
X0311	.052	.171	.274	-.058	.396	-.039	.022	.319	-198	.201	-.048
X0312	.239	.022	.563	-106	.172	.016	.155	.006	.082	.094	.042
X0313	.184	.207	.454	.071	.291	.152	.209	.196	.280	.013	-144
X0314	.124	.246	.541	.160	.261	.214	.229	-.097	.139	-101	-.026
X0315	.110	.214	.274	.205	.318	-.048	.109	.251	-.036	.007	-260
X0316	.087	.146	.356	-.013	.371	.019	-.024	.075	.203	.113	.039
X0317	.125	.211	.427	.165	.335	.095	-106	.088	.134	.010	.297
X0318	.134	.264	.467	-.031	.118	-.051	.208	-.062	.023	.043	.229

Employee Career Development

Items	1	2	3	4	5	6	7	8	9	10	11
X0401	.063	-.062	-.114	.431	.035	-.017	.243	.123	.203	.133	.243
X0402	.288	.067	-.049	.494	.128	.160	.165	.082	.077	-.051	.289
X0403	.137	.161	.169	.483	.170	-.065	.002	.244	.070	-.098	.062
X0404	.177	.233	.027	.584	.161	.057	-.023	.084	.114	.193	-.036
X0405	.119	.073	.016	.629	-.018	.310	-128	.042	.083	.094	.092
X0406	-.124	-.056	.120	.736	-120	.068	-.055	-.096	.140	.090	.023
X0407	.340	.134	-.028	.585	-.014	.040	.049	.031	-138	.031	-.073
X0408	.225	.104	.254	.354	.125	-.018	.296	.070	-.018	-.066	-136

Unit Adaptability

Items	1	2	3	4	5	6	7	8	9	10	11
X0501	-151	-.068	-.223	-.069	-.368	.135	-.019	-.368	.090	.128	-.056
X0502	-182	-.017	-.261	.031	-.329	-.165	-.051	-.263	.106	.112	.206
X0503	.017	.192	.265	.149	.369	.071	.171	.138	.129	.028	.004
X0504	-108	-.331	-.263	-.013	-.544	.127	.017	-.001	-.052	.184	-.039
X0505	-138	-.290	-.285	-.038	-.681	.050	.037	-.029	-100	.204	-.082
X0506	-.269	-.113	-.096	-.004	-.481	-.078	-.175	-.064	-.256	.171	.073

Employee Professional Development

Items	1	2	3	4	5	6	7	8	9	10	11
X0601	.058	-.001	.080	-.036	-.179	.344	.309	.237	.135	.221	.274
X0602	.043	-.014	.053	.110	-.187	.326	.324	.033	.147	.027	.264
X0603	.158	-.056	-.039	.047	-.096	.329	.067	-.084	.315	.211	.033
X0604	.124	.000	-.099	.078	.037	.660	.145	.042	-.015	.168	.032
X0605	.130	.171	.110	-.096	.067	.584	.127	.015	.257	.157	.081
X0606	.090	.044	.106	.062	-.031	.736	.057	.023	-.063	-.051	.016
X0607	-.109	.040	.073	.145	-.044	.291	.037	.132	.063	.226	.195
X0608	.071	.025	.203	.150	.067	.596	-.004	-.002	.032	-.014	-.017

Unit Creativity

Items	1	2	3	4	5	6	7	8	9	10	11
X0701	.087	.205	.138	.103	.022	.416	.494	.206	-.019	.116	.210
X0702	-.162	.052	.143	-.080	.018	.023	.471	-.008	.045	.242	.101
X0703	.133	.032	-.125	.034	.183	.001	-.221	-.010	.034	-.190	.057
X0704	.412	-.081	.079	-.077	.191	.128	.391	.108	.165	-.026	-.032
X0705	.192	.258	.039	.121	.161	.232	.562	.181	.230	-.055	.238
X0706	.061	.156	.156	-.026	-.058	.093	.625	.103	.007	-.087	-.071
X0707	-.086	.054	.247	.067	.315	.266	.313	.073	.057	.017	-.015
X0708	.243	.317	.340	.075	.147	.003	.364	-.083	.014	-.028	.045
X0709	.350	.170	.005	.105	.193	.272	.348	-.107	-.030	-.175	-.010

Cooperation Within Unit

Items	1	2	3	4	5	6	7	8	9	10	11
X0801	.149	.144	.051	.113	-.056	-.026	.297	.520	.147	.036	.166
X0802	.092	.177	.089	.253	-.013	.138	.156	.322	.082	-.122	.204
X0803	.267	.172	.181	.111	.340	.067	.034	.465	.147	-.285	.023
X0804	.081	.242	-.044	.080	.063	.095	-.020	.437	-.070	.051	.053
X0805	-.035	.140	.335	.207	.156	.006	.193	.426	.187	-.321	.028
X0806	-.060	.154	.272	-.056	.108	-.004	-.012	.481	.076	-.157	-.101

Employee Motivation

Items	1	2	3	4	5	6	7	8	9	10	11
X0901	-.003	-.139	-.117	-.017	-.007	.118	-.019	.101	-.292	-.011	.109
X0902	.183	.225	.303	.075	.031	.103	.079	.239	.392	-.224	.112
X0903	.374	-.034	.159	.194	.305	-.036	.173	.118	.369	-.128	.111
X0904	.124	.160	-.058	.216	.160	.054	.176	-.075	.341	.285	-.119
X0905	.130	.009	.098	.103	.085	.082	.047	.111	.521	-.017	-.072
X0906	.038	.232	.163	.023	.097	.154	-.030	.055	.252	.125	-.087
X0907	.140	.375	.325	.094	.241	.225	.047	.055	.378	.032	-.029
X0908	.309	.269	.234	.240	.243	.034	.056	.118	.293	.062	-.005

Degree of Unit's Work Efficiency

Items	1	2	3	4	5	6	7	8	9	10	11
X1001	.085	-.025	-.049	.144	-.051	.113	.036	-.081	.024	.719	-.098
X1002	.109	-.015	.026	.097	-.167	.194	.009	-.068	.042	.678	.121

Achievement Recognition

Items	1	2	3	4	5	6	7	8	9	10	11
X1101	.383	.260	-.057	.196	.032	.209	.061	.198	-.055	-.076	.514
X1102	.270	.224	.072	.324	.069	.219	.099	.007	-.038	-.058	.458

Principal Components Analysis

Eigenvalues

21.1 5.4 4.3 3.2 3.0 2.7 2.5 2.3 2.3 2.2 1.9

Variance (%)

22.2 5.7 4.5 3.4 3.1 2.8 2.7 2.4 2.4 2.3 2.0

APPENDIX VIII:

INTRA-SCALE VERSUS INTER-SCALE AVERAGE CORRELATIONS

Table 19: Intra-Scale Vs. Inter-Scale Average Correlations

Item	Intra	Inter	Item	Intra	Inter	Item	Inter	Intra
01*	.405	.224	34	.435	.175	66	.289	.138
02	.355	.182	35	.423	.123	67	.390	.165
03	.315	.085	36	.465	.135	68	.390	.266
04	.192	.071	37	.439	.079	69	.424	.269
05	.313	.177	38	.311	.087	70	.444	.248
06	.217	.090	39	.408	.141	71	.310	.188
07	.421	.174	40	.404	.250	72	.424	.170
08	.415	.180	41	.307	.136	74	.341	.166
09	.471	.259	42	.407	.270	75	.365	.228
10	.463	.236	43	.306	.144	77	.430	.240
11	.366	.199	44	.384	.263	79	.408	.159
12	.276	.071	45	.299	.157	80	.312	.161
13	.378	.241	46	.386	.142	81	.397	.208
14	.398	.244	47	.456	.218	82	.497	.208
15	.356	.125	48	.396	.136	83	.551	.240
16	.401	.121	49	.426	.175	84	.456	.210
17	.368	.112	50	.482	.207	85	.339	.237
18	.362	.105	51	.464	.184	86	.349	.186
19	.811	.206	52	.432	.140	87	.332	.191
20	.811	.206	53	.403	.175	88	.409	.234
21	.432	.191	54	.403	.175	89	.434	.200
22	.419	.265	55	.353	.242	90	.444	.272
23	.335	.231	56	.410	.236	91	.455	.241
24	.417	.191	57	.342	.184	92	.296	.111
25	.339	.231	58	.321	.204	93	.465	.255
26	.460	.185	59	.402	.256	94	.375	.170
27	.308	.138	60	.485	.298	95	.512	.260
28	.335	.094	61	.417	.181	96	.447	.228
29	.824	.090	62	.369	.135	97	.381	.205
30	.824	.096	63	.407	.199	98	.355	.203
31	.353	.142	64	.428	.202	99	.394	.213
33	.420	.111	65	.359	.152			

*Numbers refer to questionnaire item numbers.

APPENDIX IX:

INDIVIDUAL ITEMS WHOSE INTER-SCALE CORRELATION
WAS HIGHER THAN THE INTRA-SCALE MEDIAN CORRELATION

Table 20: Individual Items Whose Inter-Scale Correlation
Was Higher than the Intra-Scale Median Correlation

Number of Interscale Item Overlaps**	Number of Interscale Item Overlaps**	Number of Interscale Item Overlaps**
01*	34	66
02	35	67
03	36	68
04	37	69
05	38	70
06	39	71
07	40	72
08	41	74
09	42	75
10	43	77
11	44	79
12	45	80
13	46	81
14	47	82
15	48	83
16	49	84
17	50	85
18	51	86
19	52	87
20	53	88
21	54	89
22	55	90
23	56	91
24	57	92
25	58	93
26	59	94
27	60	95
28	61	96
29	62	97
30	63	98
31	64	99
33	65	

*Numbers refer to questionnaire item numbers.

**An item correlated with this many effectiveness dimensions more highly than with its own effectiveness dimension.

APPENDIX X:

THE CAUSAL AND INTERVENING ITEMS WHICH CONSTITUTE
THE ELEVEN EFFECTIVENESS DIMENSIONS

Table 21: The Causal and Intervening Items Which Constitute the Eleven Effectiveness Dimensions

<u>Effectiveness Dimension</u>	<u>Causal</u>	<u>Intervening</u>
1. Organizational Synergy	<p>Coordination or work with other units</p> <p>Quality of support functions within unit</p> <p>Degree of long-term planning and goal setting within unit</p> <p>Interdepartmental relations</p> <p>Effectiveness of interdepartmental communication</p>	<p>Degree to which company management accurately perceives unit effectiveness</p> <p>Degree of achievement recognition unit receives</p> <p>Health of entire company</p> <p>Flexibility of top management</p> <p>Level of performance goals unit is expected to achieve</p> <p>Unit employees' attitudes toward company and its goals</p> <p>Degree to which unit supervisor has "ear" of top management</p> <p>Degree to which company management understands units' needs</p> <p>Degree of units' integration with entire company</p>

<u>Effectiveness Dimension</u>	<u>Causal</u>	<u>Intervening</u>
2. Unit Health	Units' ability to obtain resources	Process of filling vacancies
	Degree of units' sense of identity	Unit employees' degree of satisfaction with their professional growth and development as a result of their work experiences
	Degree to which employees understand the units' goals and objectives	
	Unit employee comfort in physical work environment	Unit employees' degree of satisfaction with their salary levels
	Degree of units' supervisors' understanding of the jobs in their areas	Unit employees' degree of satisfaction from working in the unit
		Degree of units' stability
		Degree of employee psychological commitment to unit
		Degree to which employees feel that they are contributing to the work of the unit
		Degree to which unit employees' career goals are met
		Units' degree of control over its environment

<u>Effectiveness Dimension</u>	<u>Causal</u>	<u>Intervening</u>
3. Information Flows Within Unit	<p>Equity of treatment and rewards</p> <p>Level at which decisions are finally made</p> <p>Extent to which superiors willingly share information</p> <p>Extent to which employees are involved in deci- sions related to their work</p> <p>Level of super- visors' awareness of how well their performance meets company's standards</p> <p>Range of responsi- bilities assigned to individual positions</p>	<p>Extent to which review and central functions are concentrated</p> <p>Extent to which superiors have confidence and trust in subordinates</p> <p>Extent to which subordinates have confidence and trust in superiors</p> <p>Direction of Inform- ation flow</p> <p>Extent to which communications are willingly accepted by subordinates</p> <p>Adequacy of upward communication</p> <p>Level of responsi- bility employees feel for initiating upward communication</p> <p>Accuracy of upward communication</p> <p>Adequacy and accur- acy of horizontal communications</p> <p>Amount of coopera- tive teamwork</p> <p>Employees' attitudes towards other members of the unit</p> <p>Level of supervisors confidence in their ability to supervise</p>

<u>Effectiveness Dimension</u>	<u>Causal</u>	<u>Intervening</u>
4. Employee Career Development	Emphasis on activities outside work to enhance employees' personal development	
	Rewards or encouragement for role performance	
	Management training and skills of supervisors within unit	
	Amount of career development activity provided for employees within the unit	
	Number of employees who have participated in activities to enhance their communication skills	
	Number of employees who received career counseling	
	Adequacy of resources to assist in training subordinates	
	Degree of employee involvement in unit goal setting	

<u>Effectiveness Dimension</u>	<u>Causal</u>	<u>Intervening</u>
5. Unit Adaptability	<p>Degree of consistency of methods and practices of supervisors</p> <p>Amount of time and effort wasted through poor internal coordination</p> <p>Amount of "dead weight"</p>	<p>Level of resistance to change</p> <p>Degree to which unit can be counted on to come through under pressure</p> <p>Amount of time lost and wasted through indecision</p>
6. Employee Professional Development	<p>Emphasis on employees engaging in academic activities outside company</p> <p>Emphasis on employees engaging in professional activities outside company</p> <p>Number of individuals not associated with unit who serve on projects</p>	<p>Number of unit employees who have national reputation</p> <p>Number of unit employees engaging in extra work and study related to their jobs over and above what is specifically designed</p> <p>Number of unit employees who work at the "cutting edge" of their fields</p> <p>Number of unit employees in school</p> <p>Number of unit employees who attend professional meetings</p>

<u>Effectiveness Dimension</u>	<u>Causal</u>	<u>Intervening</u>
7. Unit Creativity	<p>Degree to which unit deviates from established policy and procedure</p> <p>Degree to which detailed routines are set up for operation</p> <p>Degree to which results rather than procedures are emphasized</p> <p>Emphasis on creativity</p> <p>General style of supervision</p> <p>Amount of supervisory freedom to take action</p>	<p>Levels of competence and skill of individuals</p> <p>Degree of readiness to tackle unusual problems</p> <p>Units' intellectual environment</p>
8. Cooperation Within Unit	<p>Extent to which unit has a people centered atmosphere</p> <p>Person in units' supervisor's position</p>	<p>Degree to which the unit initiates improvement in work methods/operations</p> <p>Degree to which unit accurately perceives its environment</p> <p>Degree of resolution of conflicts and disagreements</p> <p>Amount of conflict and friction</p>

<u>Effectiveness Dimension</u>	<u>Causal</u>	<u>Intervening</u>
9. Employee Motivation	Degree to which personnel assign- ments are based on tenure	Degree of inter- dependence of the work done in the unit
	Degree to which personnel assign- ments are based on skill and expertise	Number of employees who have a positive perception of their self-image
	Degree of focus on the achievement of the units' goals	Number of employees who are challenged by their work assignments
	Degree of change of individual job duties and respons- ibilities	Amount of inter- action within unit aimed at achieving the companys' objectives
10. Degree of Units' Work Efficiency	Amount of time spent on projects unrelated to the major objectives	
	Number of activities not related to work engaged in by unit employees	
11. Achievement Recognition Within Unit	Existence of reward and recognition systems for indivi- dual output	
	Existence of reward and recognition systems for group output	

APPENDIX XI:

INTERCORRELATIONS OF END-RESULT VARIABLES WITH THEMSELVES
AND WITH THE CAUSAL AND THE INTERVENING VARIABLES

Table 22:

Intercorrelations of End-Result Variables with Themselves
and with the Causal and the Intervening Variables

* End-Result Variables

- A. Quality of output
- B. Unit's degree of goal achievement
- C. Amount of work done on time
- D. Unit's level of efficiency
- E. Percentage of project completions
- F. Percentage of results adopted by company
- G. Frequency of cost overruns
- H. Number of patents or copyrights
- I. Percentage of project approvals
- J. Number of technical reports produced
- K. Unit profitability
- L. Number of papers presented at professional meetings
- M. Number of professional rewards or honors

★	A	B	C	D	E	F	G	H	I	J	K	L	M
A	1.000	.3618	.2765	.3723	.2071	.3027	.0537	.0488	.1790	.1907	-.0691	.1208	.0826
B	.3618	1.000	.2956	.5016	.1012	.1431	.1070	.1057	.0878	-.1072	.1014	-.0245	.0138
C	.2765	.2956	1.000	.2597	.2695	.1257	.1627	-.0318	.1711	-.0763	-.0558	-.1294	-.1038
D	.3723	.5016	.2597	1.000	.0729	.2151	-.0305	.1210	.2693	.0512	.2047	.0371	.0501
E	.2071	.1012	.2695	.0729	1.000	.1893	.2174	.1487	.2845	.4275	.0909	.2795	.2074
F	.3027	.1431	.1257	.2151	.1893	1.000	.0830	.2001	.2373	.1482	.1023	.0758	.1686
G	.0537	.1070	.1627	-.0305	.2174	.0830	1.000	.0604	.2427	.2379	.0451	.1401	.1408
H	.0488	.1057	-.0318	.1210	.1487	.2001	.0604	1.000	.2451	.3730	.0235	.5985	.6750
I	.1790	.0878	.1711	.2693	.2845	.2373	.2427	.2451	1.000	.3556	.2413	.3329	.3178
J	.1907	-.1072	-.0763	.0512	.4275	.1482	.2379	.3730	.3556	1.000	-.0130	.6830	.6018
K	-.0691	.1014	-.0558	.2047	.0909	.1023	.0451	.0235	.2413	-.0130	1.000	.0672	.0847
L	.1208	-.0245	-.1294	.0371	.2795	.0758	.1401	.5985	.3329	.6830	.0672	1.000	.8522
M	.0826	.0138	-.1038	.0501	.2074	.1686	.1408	.6750	.3178	.6018	.0847	.8522	1.000

*	6	10	14	25	45	49	50	51	53	59	77	95	96
A	.1660	.2785	.3335	.2540	.3437	.2677	.1686	.1805	.3634	.1834	.3784	.3870	.2122
B	.3144	.1847	.1003	.1181	.2275	.1413	.1541	.1241	.3031	.1900	.2512	.1929	.2420
C	.3221	-.0977	.0164	.1254	.2208	.0385	.0128	-.0262	.1451	.0299	.0116	.0421	.1235
D	.2510	.2842	.2515	.3090	.3539	.3016	.2957	.3556	.3659	.3670	.3702	.3879	.3547
E	.0422	.0270	.1112	.0420	.0244	.0286	.0372	.1134	.1517	.0542	.0674	.1151	.0159
F	.1320	.2827	.1620	.3778	.1798	.2613	.2428	.3006	.2982	.2396	.1917	.2929	.2933
G	.2551	.0611	-.0621	-.0116	-.2265	-.0605	.0337	.0441	.0022	-.0943	-.0543	-.0059	-.0668
H	-.2394	.0610	.1166	.0410	.1211	.1242	.0895	.1307	.1486	.1832	.1962	.0300	.0377
I	.0397	.1559	.1686	.0593	.1495	.1506	.0749	.2225	.2296	.0851	.1561	.1277	.1052
J	-.2028	.0244	.1163	.0184	.0352	.0854	-.0301	.0689	.1800	-.0046	.1218	.0340	-.1046
K	.1138	.1959	.1877	.2386	.0697	.0755	.2566	.2654	.0949	.0732	.0684	.1491	.1918
L	-.2358	.1101	.2950	-.0716	.1039	.0206	.0413	.1127	.0975	.0530	.2478	.1131	-.0768
M	-.2631	.0643	.2158	.0604	.0825	-.0270	.0276	.0837	.0841	.0004	.1888	.0170	-.0762

★	99	2	11	40	43	60	88	89	90	91	92	93	94
A	.2772	.1022	.2367	.1163	.0317	.2829	.2629	-.0422	.1688	.1627	.0943	.2135	.0935
B	.2048	.0897	.1475	.1145	.1485	.2812	.1237	.1486	.2318	.2182	.0714	.1133	.1908
C	.1264	.0802	-.0297	.0125	.0564	.0849	.0400	.1065	.1225	.1334	-.0892	.1287	-.0103
D	.2957	.2091	.2304	.1894	.1131	.3191	.2086	.2203	.2481	.2546	.0495	.2390	.1622
E	-.0137	.0384	.1164	.0135	.0969	.0805	.1147	-.0968	-.0480	.0805	.0730	.2070	.0647
F	.3778	.0873	.2790	.0538	-.0464	.1740	.1964	.1135	.1500	.1383	-.0338	.0981	-.0390
G	-.0264	-.0809	.0017	-.0078	-.0909	-.0211	.0393	-.0668	-.0595	-.0093	-.0009	-.0455	-.1112
H	.0651	-.0168	.1602	.1803	.0176	.0799	.0582	.0136	.0708	-.0058	.0139	-.0179	.0326
I	.1646	.0325	.1605	.0175	-.1023	.1517	.1552	.0543	.0705	.0937	.0185	.0712	.0139
J	.0257	-.0699	.1951	.0678	-.0493	-.0206	.1000	-.1083	-.0667	-.0658	.1099	.1101	-.0352
K	.1790	.1164	.0994	.0649	.0505	.1607	.1736	.1684	.1825	.1808	-.0733	.1439	.2725
L	.0334	.0279	.2503	.0908	-.0087	.0345	.0479	-.0550	-.0706	-.0242	.0107	.1099	-.0260
M	.1510	.0133	.2017	.1224	.0452	.0019	.1039	-.0311	-.0442	-.0097	.0272	.0674	.0039

★	97	98	44	54	55	56	57	61	62	63	64	65	66
A	.0871	.1639	.1739	.3362	.2756	.2038	.1020	.3266	.1843	.1450	.3286	.2833	.1963
B	.2148	.2069	.2778	.3502	.2040	.0990	.3180	.2608	.1243	.1333	.1958	.2137	.0733
C	-.0660	.0191	.1655	.1793	.0984	.0918	.0501	.1076	.1308	.1904	.0905	.1281	.1335
D	.2448	.1325	.2288	.3522	.3006	.1906	.1910	.1790	.0723	.1805	.2018	.2431	.1682
E	.1090	.0551	.0167	.1732	.1766	.0275	.0931	.0703	.0915	.0202	.0307	.0930	.0709
F	.0855	-.0641	.0752	.1645	.0654	.0951	.1093	.1950	.0310	.1186	.1921	.1848	.0590
G	-.2307	-.0194	-.0910	.0873	-.1707	-.1953	.0678	.0880	.0000	.1881	.0122	-.0969	-.0906
H	.1181	.0435	.0124	.0809	.0028	.0200	.0363	.1462	.0351	-.0832	.0845	.1315	.0255
I	.1262	-.0235	.0347	.1117	.2005	.0670	.0872	.1288	.0235	.0498	.1205	.0655	.1039
J	.0011	-.0065	-.0988	.0305	.1130	-.0506	-.0064	.0671	.0294	-.0818	-.0156	.0347	.1129
K	.2439	-.0046	.1117	-.0788	.0003	.0361	-.0302	-.0917	-.1562	.1421	.0085	-.0072	-.0204
L	.1126	.0940	.0127	.0484	.0587	-.1018	.0302	.0915	.0077	-.1121	-.0062	.0854	.0126
M	.0802	.1007	.0190	.0827	.0176	-.0151	.0191	.0996	-.0024	-.0647	.0003	.0694	.0061

*	67	69	70	71	74	75	86	18	21	24	26	36	37
A	.2734	.2603	.3426	.2133	.2665	.3065	.2702	.0166	.1759	.1238	.0885	.0619	.0619
B	.1777	.3211	.4294	.1503	.3068	.3885	.1628	-.0151	.1445	.1355	.1581	.1639	.1639
C	.0822	.2022	.2037	.1726	.1445	.1567	.2032	-.0977	.1315	.0796	.0939	.1819	.1819
D	.2138	.3056	.3082	.0929	.2704	.3533	.1958	.1435	.3162	.1918	.1731	.1942	.1942
E	.1906	.1589	.1741	-.0595	.1556	.0969	.1190	-.0390	.1902	.0035	.0159	-.0891	-.0891
F	.0415	.1427	.1601	.1885	.1171	.1495	.0136	.1945	.2823	.2655	.2589	.0568	.0568
G	.1073	.0167	-.0280	.0434	.1118	-.1120	.1144	-.1660	-.0454	-.0463	.1143	-.0778	-.0778
H	.0134	.0672	.1008	.0128	.0020	.1300	-.0640	.1120	.1875	-.0494	.2014	.0740	.0740
I	.1758	.1943	.1274	.1277	.0982	.1567	.1985	.0648	.1681	-.0705	.0672	.1039	-.1039
J	.1009	.0272	.0570	-.1331	-.0075	.1057	.0830	-.0042	.0996	-.1373	.0517	-.0164	-.0164
K	.0680	.1976	-.0039	.1324	.1406	.1898	-.0449	.1223	.2563	.1095	.1318	.0392	.0392
L	.0568	.0399	.0977	-.1056	.0071	.1162	.0701	.0808	.1727	-.1407	.0491	-.0168	-.0168
M	.0270	.0371	.1611	-.0476	-.0492	.1854	.0806	.0833	.2800	-.0550	.1279	.0996	.0996

*	52	58	72	79	81	82	83	84	16	17	28	33	34
A	.1388	.1675	-.1685	-.1142	.2342	-.1104	-.2814	-.2103	.0620	.0991	-.0392	-.0939	.1667
B	.1074	.3697	-.0525	-.1301	.2306	-.2227	-.2403	-.2387	.0147	-.0874	.1438	.0970	.1592
C	.1238	.0725	-.0216	.0344	.3320	-.2190	-.2166	-.0751	-.1588	-.2333	-.0932	-.2428	-.2002
D	.0955	.2734	-.1026	-.1328	.1856	-.1735	-.2332	-.3240	.0824	.1171	.1758	.1263	.1526
E	.0356	.0394	-.0013	-.0593	.0587	-.1806	-.0539	-.0424	-.0138	-.0907	.0930	-.0080	.0143
F	.2623	.1704	-.1978	-.1949	.0278	-.2834	-.2876	-.2180	-.0396	.0255	-.0045	.1249	.1263
G	-.0145	-.0469	.1156	-.0009	-.0528	-.0142	-.0368	.0314	-.0906	-.1251	.0182	-.0630	-.0280
H	.0243	.2244	-.0329	.0340	-.0451	-.0374	.0120	-.0557	.2295	.2763	.0983	.4947	.1869
I	.0854	.1359	-.0702	-.1950	.1612	-.1450	-.1683	-.0440	-.0098	-.0475	.0455	.0737	-.0633
J	-.0429	-.0005	-.0547	-.0432	-.0987	-.0329	-.0869	-.0185	.0581	.1374	.0865	.2107	.0745
K	.1616	.1524	-.1970	-.1324	.2420	-.0290	-.0411	-.1035	-.0348	.0277	.1132	.2150	.0754
L	.0033	.1103	.0055	-.0495	-.0701	.0614	-.0138	-.0117	.3331	.3521	.1140	.4484	.1617
M	.0757	.1380	-.0601	-.0277	-.0705	.0347	-.0156	-.0596	.2630	.3102	.1188	.4650	.1953

*	35	38	39	1	3	4	5	22	46	80	85	87	7
A	.1139	.0023	-.0038	.1468	.0337	.0820	.1927	.1244	.1523	.2688	.2931	.3720	.1250
B	.2148	-.0085	.1334	.1511	.0699	.0300	.3210	.0666	.1404	.1506	.2157	.1297	-.0124
C	-.1292	.0619	-.0442	-.1983	-.0628	.1773	-.0621	-.0540	-.1152	.0799	.1626	-.0441	.0072
D	.2307	.0059	.1444	.2342	.0743	.1720	.2737	.2131	.1132	.0989	.3274	.3669	.0423
E	-.0793	-.0352	-.0716	.0761	-.0487	.0962	.1111	.1503	.1332	.0732	.2157	.1539	.1274
F	.0726	.0964	.1177	.1059	-.1373	.1586	.2531	.1743	.0476	.2003	.1839	.2054	.2008
G	.0405	.0318	-.0128	-.0174	-.2038	.0702	-.0692	-.1620	-.0728	-.0893	-.1040	.0686	.0723
H	.3050	.1146	.1849	.2398	-.0527	-.0703	.1524	.1872	.1010	-.0060	.0694	.1571	-.0129
I	.1423	.0171	.0077	.1723	.0324	.0319	-.0108	.1316	.1482	.1589	.1087	.2458	.0948
J	.1738	.0683	.0975	.2583	-.0889	-.0143	-.0323	.0900	.0716	.1068	.0182	.2542	.0008
K	.0976	.0423	.0944	.1280	.0070	.1414	.1237	.1763	.0938	.0612	.0408	.1234	.1035
L	.3613	.1233	.2809	.4773	.0963	-.0379	.1124	.2130	.2442	.1569	.0707	.3317	.0461
M	.3321	.1256	.2424	.4188	.0001	-.0367	.0707	.2510	.1599	.0930	.0739	.3082	.0308

*	8	9	15	47	48	12	13	23	27	31	41	42	68
A	.0399	.1636	.0585	.1145	-.0941	-.0806	.1721	.2945	.0726	.0333	.1371	.2398	.3562
B	.0882	.2413	.0507	.1878	.0259	-.1088	.1990	.4120	.1395	.2268	.2304	.3342	.2110
C	-.1173	.1394	-.0672	.0676	.0604	.0093	.0374	.2265	.0190	.0730	.0218	.0861	.2273
D	.1449	.2316	.1161	.0687	-.0415	-.1003	.1928	.4058	.1576	.2207	.2611	.3075	.3767
E	-.1039	-.0202	-.1118	.0628	-.0309	-.0223	.0762	.1287	-.0051	.0052	-.0657	-.0141	.0215
F	.2032	.3115	.0644	.2638	.0751	.0416	.2432	.2844	.0315	.1335	-.0382	.1550	.3252
G	-.1358	.0456	-.1203	-.0818	.0060	.0469	.0310	.0424	-.0843	.0642	.1065	-.0972	-.0336
H	.0552	-.0337	.0351	.0562	.0072	-.0594	.0523	-.0017	.1424	.0785	-.0663	.0601	.0972
I	.0397	.2164	.0867	.1000	.0105	.0618	.0477	.1673	-.0019	.1121	-.0658	.0592	.2045
J	.0179	-.1284	-.1016	.1250	.0045	.0481	-.0458	-.0233	.0019	-.0187	-.1609	-.0841	-.0396
K	.1584	.2575	.2001	.1771	.1954	-.0790	.1577	.1996	-.0559	.2247	.1120	.1425	.2259
L	.0381	-.0651	-.0541	.0595	.0238	.1051	.0194	.0223	.0255	.0362	-.1572	-.0963	-.0669
M	.0503	-.0295	-.0463	.1034	.0573	.0254	.0822	.0117	.0567	.0512	-.1525	-.0608	-.0480

★	29	30	19	20
A	-.0989	-.1542	.1798	.1713
B	-.0375	.0201	.1526	.1326
C	-.1142	-.0239	-.0224	.1761
D	.0800	.0844	.1412	.2058
E	-.0416	-.0057	.0333	.1823
F	.0227	-.0716	.1585	.1635
G	.0348	.0207	-.0917	-.1056
H	.1775	.1713	.1753	.1926
I	.1534	.1093	.0939	.1549
J	-.0397	-.0230	-.0266	.0764
K	.0690	-.0109	.2408	.2467
L	.0107	.1318	.1989	.2306
M	-.0115	.0694	.2337	.2505

